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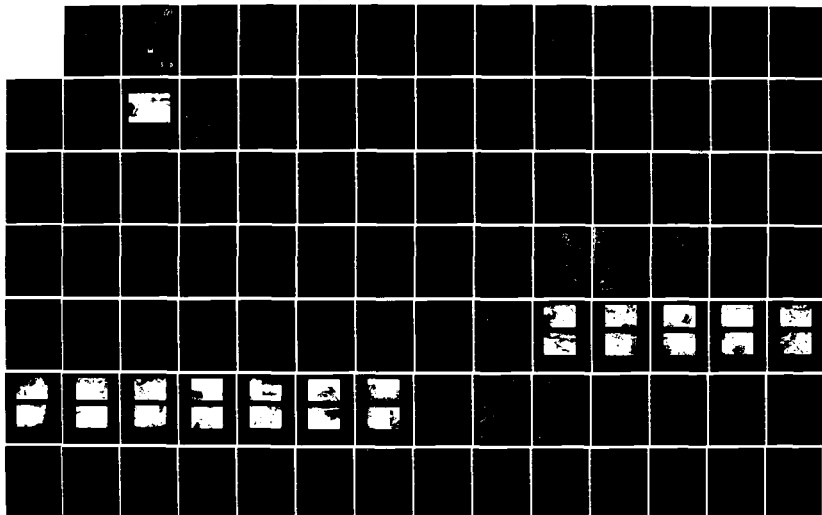
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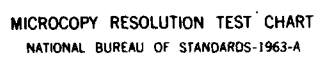
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CONNECTICUT COASTAL
MERIDEN, CONNECTICUT

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**BALDWINS POND DAM
CT 00133**

**PHASE 1 INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM**



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JULY 1981

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Baldwins Pond Dam is an earthen embankment dam with a downstream vertical stone masonry wall extending along about two thirds of the dam length. The total length of the dam is 190 ft. including the spillway, while the maximum height as measured from the left spillway abutment is 15.5 ft. The dam is in poor condition. The inspection revealed that there was extensive seepage at the emergency spillway and significant seepage through and displacement of the downstream stone masonry wall.		



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:

AUG 17 1981

NEDED

Honorable William A. O'Neill
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor O'Neill:

Inclosed is a copy of the Baldwins Pond Dam (CT-00133) Phase I Inspection Report, prepared under the National Program for Inspection of Non-Federal Dams. This report is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. I approve the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is vitally important.

Copies of this report have been forwarded to the Department of Environmental Protection, and to the owner, City of Meriden - Public Works Dept., Meriden, CT. Copies will be available to the public in thirty days.

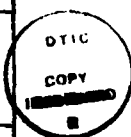
I wish to thank you and the Department of Environmental Protection for your cooperation in this program.

Sincerely,

C. E. EDGAR, III
Colonel, Corps of Engineers
Commander and Division Engineer

Incl
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BALDWINS POND DAM

CT 00133

CONNECTICUT COASTAL

MERIDEN, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

LETTER OF TRANSMITTAL
FROM THE CORPS OF ENGINEERS TO THE STATE
TO BE SUPPLIED BY THE CORPS OF ENGINEERS

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification No.: CT 00133
Name of Dam: Baldwins Pond Dam
Town: Meriden
County and State: New Haven County, Connecticut
Stream: Harbor Brook
Date of Inspection: May 27, 1981

BRIEF ASSESSMENT

Baldwins Pond Dam is an earthen embankment dam with a downstream vertical stone masonry wall extending along about two thirds of the dam length. The total length of the dam is 190 feet including the spillways, while the maximum height as measured from the left spillway abutment is 15.5 feet. The width of the dam varies from a minimum of 9 feet at the left spillway abutment to 17 feet near the middle of the right embankment. The maximum impoundment with water at the top of dam is 40 acre-feet. The main spillway is a 62 foot long vertical stone masonry wall located on the left side of the dam while there is an emergency spillway consisting of a 19 foot long, 8 inch wide concrete wall near the right abutment. There are three outlets associated with the dam. These outlets include a 24 inch cast iron pipe with a gate valve passing through the emergency spillway; a 12 inch cast iron pipe set in a 3 foot x 3.75 foot stone box outlet near the right end of the main spillway and controlled by a valve key; and a third outlet with the intake located near the left end of the spillway and controlled by a shear gate valve leading to a stone tunnel which discharges to the downstream spillway channel. There is some question as to the condition of these outlets and their controls and the capacity of each. The location of these outlets is shown in Plate B-1. The purpose of the dam is to provide recreation for Town residents.

The visual inspection of Baldwins Pond Dam indicated that the dam is in poor condition. The inspection revealed that there was extensive seepage at the emergency spillway and significant seepage through and displacement of the downstream stone masonry wall. In addition, there were trees growing on the right dam embankment which could create further seepage problems, especially if they become uprooted during storms. There was an area of overtopping of the reservoir bank upstream of the left dam abutment. There was inadequate riprap or concrete protection of the soil on the upstream dam face and on the dam crest at the emergency spillway and along the emergency spillway discharge channel.

Based on its small size and its significant hazard classification and in accordance with the Corps Guidelines, the test flood is equal to a 100 year flood. The peak inflow to the pond is 4100 cfs based upon a drainage area of 8.19 square miles and a peak inflow factor of 500 cfs per square mile as determined from the Corps peak inflow curves for rolling to mountainous areas. The peak outflow is 4035 cfs which will result in overtopping the dam by 2.4 feet. The combined capacity of the spillways is 490 cfs or 12% of the peak outflow.

Based upon the findings of the visual inspection and hydrologic and hydraulic analysis there is need for additional engineering input, analysis and design. This would include investigating the seepage at the emergency spillway and the downstream masonry wall along with the displacement of that wall. An analysis of the adequacy of the riprap at the dam's upstream face, emergency spillway and emergency spillway channel is recommended. The trees growing along the dam embankment should be removed along with their roots and voids filled with properly backfilled and compacted material. Other vegetation growing along the crest should be removed and replaced with proper protection. A detailed hydrologic and hydraulic investigation is needed to assess further the potential of overtopping the dam and the need for and the means to increase project discharge capacity. Included in this analysis should be a method of protecting the reservoir bank upstream of the left dam embankment from erosion, and an analysis of the adequacy of the dam's outlet works and a determination if there is a need for modifications/additions to them.

The recommendations and remedial measures are described in Section 7 and should be addressed immediately upon receipt of this Phase I Inspection Report by the owner.



Pratap Z. Patel, P.E.
Project Manager

Pratap Z. Patel

Philip W. Genovese & Associates, Inc.
Hamden, Connecticut

This Phase I Inspection Report on Baldwins Pond Dam (CT-00133) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.



RICHARD DIBUONO, MEMBER
Water Control Branch
Engineering Division



ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division



CARNEY M. TERZIAN, CHAIRMAN
Design Branch
Engineering Division

APPROVAL RECOMMENDED:



JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at

some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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U.S. ARMY ENGINEER DIV.
NEW ENGLAND
CORPS OF ENGINEERS
WALTHAM, MASS.

PHILIP W. GENOVESE AND
ASSOCIATES, INC.
ENGINEERS HAMDEN, CT.

NATIONAL
PROGRAM
OF
INSPECTION
OF
NON FED
DAMS

OVERVIEW PHOTO

BALDWINS POND DAM

HARBOR BROOK

MERIDEN

CONNECTICUT

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

BALDWINS POND DAM - CT 00133

SECTION I

PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized The Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Philip W. Genovese and Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in South Central Connecticut. Authorization and notice to proceed were issued to Philip W. Genovese and Associates, Inc., under a letter of November 17, 1980 from Colonel William E. Hodgson Jr., Corps of Engineers. Contract No. DACW 33-81-C-0017 has been assigned by the Corps of Engineers for this work.

b. Purpose

1. Perform technical inspection and evaluation of non-federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-federal interests.
2. Encourage and prepare the states to initiate quickly effective dam safety programs for non-federal dams.
3. Update, verify, and complete the National Inventory of Dams.

1.2 Description of Project

a. Location

Baldwins Pond Dam is located in the City of Meriden in New Haven County, Connecticut. Baldwins Pond is just South of Westfield Road near the intersection of Westfield Road and North Wall Street, and a short distance west of Connecticut Highway Route 15. The dam impounds the waters of Harbor Brook, and is shown on the Meriden, Connecticut Quadrangle with the approximate coordinates of North $41^{\circ}32.9'$, West $72^{\circ}46.5'$. Harbor Brook flows into Hanover Pond and the Quinnipiac River approximately 3 miles southwest of Baldwins Pond.

b. Description of Dam and Appurtenances

The dam is an earthen embankment with a downstream vertical stone masonry wall which extends along approximately two-thirds of the dam length. The structural height of the dam is 15.5 feet, and the total length is approximately 190 feet. The main spillway is a vertical stone masonry wall 62 feet in length located on the left side of the dam. There is an "emergency" spillway which originates at the right side of the dam. The emergency spillway channel extends along the downstream toe of the dam to join the main spillway channel, and has a concrete cutoff wall near the right abutment, stone masonry side walls, and a riprapped channel. There are three low level outlets at the dam. A 24 inch cast iron pipe extends through the emergency spillway and is controlled by a gate valve on the downstream side of the dam. A 12 inch cast iron pipe exits the dam through a 3 foot by 3 3/4 foot stone box outlet to the right of the spillway and this pipe is reportedly controlled by a valve key. A third outlet, reportedly a 12 inch cast iron pipe, is controlled by a shear gate near the upstream left abutment of the dam and exits through a tunnel entering the downstream spillway channel to the left of the dam. This was part of the original grist mill.

A plan of the dam and spillways appears in Appendix B. Photographs of the various features are shown in Appendix C.

c. Size Classification

The dam has a maximum impoundment of 40 acre-feet and structural height of 15.5 feet. For the purpose of this report, this places it in a SMALL size category. Table I of Corps guidelines classifies a dam with 50 to 1000 acre-feet of storage as being small in size.

d. Hazard Classification

The hazard potential classification for this dam is SIGNIFICANT, using the Corps Guidelines. This classification may be substantiated by a number of factors. Brookside Park, located downstream between North Broad Street and Connecticut Route 66, would experience a flood depth of approximately 2 feet in the case of a dam failure. The pre & post failure depths at this impact area are estimated to be 3.5 feet and 5.0 feet respectively. Since this park is actively used by people of all ages a dam breach could result in the loss of a few lives. Also, economic losses could be appreciable since there would be heavy flooding at the bridge on Westfield Road nearest the dam and over the road surface for a considerable distance, where a culvert would be inadequate to handle the flood waters. There could also be significant damage at Brookside Park.

e. Ownership

Baldwins Pond Dam is owned by the City of Meriden, Connecticut. The address is:

City of Meriden - Public Works Department
City Hall
142 East Main Street
Meriden, Connecticut 06450

Telephone: 203-634-0003

f. Operator

The operation and maintenance of the dam are under the control of Mr. Bruce Marks, Director of Public Works for the City of Meriden, CT.

g. Purpose of the Dam

The present purpose of Baldwins Pond Dam is primarily recreational.

h. Design and Construction History

It is known that Baldwins Pond Dam was originally constructed prior to 1851 by Amos Baldwin for his grist mill, but there are no records available to indicate the year, design, or construction procedures. On April 12, 1973 the dam was inspected by Buck and Buck, Consulting Engineers, of Hartford, Connecticut, who found it to be in poor condition.

The City of Meriden was notified of the condition of the dam by the Connecticut Department of Environmental Protection, Division of Water and Related Resources. Pursuant to this notification, on July 7, 1973, an order to make the necessary repairs was issued by the State, but none of the recommended work was done. On August 13, 1979 a Superior Court judgement was entered stipulating that the needed repairs be completed "within twelve months from the issuance of the construction permit, but in any case no later than May 1, 1981." However, the court order was not complied with. No engineering report was prepared for the necessary repairs nor were any repairs made. Copies of pertinent letters, order, and judgement may be found in Appendix B of this report.

i. Normal Operational Procedures

No data was disclosed for maintenance of reservoir water levels.

1.3 Pertinent Data

a. Drainage Area

The drainage area for Baldwins Pond Dam covers 8.19 square miles or 5242 acres of rolling to mountainous terrain. Much of this area has been developed for residential and commercial purposes, with numerous street drainage systems. There are also some large wooded areas and several sizeable bodies of water, notably the Bradley Hubbard Reservoir, Bishops Pond, and Black Pond. Elevations in the watershed range from 195 to 892 NGVD.

b. Discharge at Damsite

1. The outlet works at the dam consists of two 12 inch and one 24 inch cast iron pipe with invert elevations of 190.9, 185.6 and 179.0.
2. The maximum flood at damsite in the past is unknown.
3. The ungated spillway capacity at top of dam elevation of 196.8 is 490 cfs.
4. The ungated spillway capacity at test flood elevation of 199.2 is 1925 cfs.

5. The gated spillway capacity at normal pool elevation is N/A.

6. The gated spillway capacity at test flood elevation is N/A.

7. The total spillway capacity at test flood elevation of 199.2 is 1925 cfs.

8. The total project discharge at top of dam elevation of 196.8 is 490 cfs.

9. The total project discharge at test flood elevation of 199.2 is 4035 cfs.

c. Elevation (Feet above NGVD)

1. Streambed at centerline of dam	181.3
2. Bottom of cutoff	Not applicable
3. Maximum tailwater	Unknown
4. Normal pool	195.0
5. Full flood control pool	Not applicable
6. Spillway crest (ungated)	195.0
7. Design surcharge	Unknown
8. Top of dam	196.8
9. Test flood surcharge	199.2

d. Reservoir (Length in feet)

1. Maximum pool	1640
2. Normal pool	800
3. Flood control pool	Not applicable
4. Top of dam	1160
5. Spillway crest pool	800

e. Storage (Acre-feet)

1. Normal pool	25
2. Flood control pool	Not applicable
3. Spillway crest pool	25
4. Top of dam	40
5. Test flood pool	52

f. Reservoir Surface (Acres)

1. Normal pool..... 5.5
2. Flood-control pool..... Not applicable
3. Spillway crest..... 5.5
4. Test flood pool 18.8
5. Top of dam 11.2

g. Dam

1. Type..... Earthen embankment with
stone masonry wall
2. Length..... 190 feet
3. Height..... 15.5 feet
4. Top width Varies 9 feet - 17 feet
5. Side slopesUpstream 5:2
Downstream Vertical
6. Zoning Unknown
7. Impervious core Unknown
8. Cutoff Unknown
9. Grout curtain Unknown

h. Diversion and Regulating Tunnel

1. Type None
2. Length None
3. Closure..... None
4. Access None
5. Regulating Facilities..... None

i. Spillway

	<u>Emergency</u>	<u>Main</u>
1. Type	Masonry & Concrete	Masonry & Concrete
2. Length of weir	19 feet	62 feet
3. Crest elevation	195.6	195.0
4. Gates	Not Applicable	Not Applicable
5. Upstream channel	Underwater	Underwater
6. Downstream channel	Riprap	Underwater

j. Regulating Outlets

- | | |
|----------------------------|----------------------------------------------|
| 1. Inverts..... | 185.6 |
| | 190.9 |
| | 179.0 |
| 2. Size..... | 12 inch cast iron pipe |
| | 24 inch cast iron pipe |
| | 12 inch cast iron pipe |
| 3. Description | 12 inch cast iron pipe passing through right |
| | spillway abutment |
| | 24 inch cast iron pipe passing through emer- |
| | gency spillway |
| | 12 inch cast iron pipe passing through left |
| | spillway abutment to tunnel |
| | downstream of dam |
| 4. Control Mechanism | Valve Key |
| | Gate valve downstream side of dam |
| | Shear Gate upstream of dam |

SECTION 2
ENGINEERING DATA

2.1 Design Data

Baldwins Pond Dam is an old dam, having been constructed prior to 1851. No construction plans were available for review.

2.2 Construction Data

No construction plans or records were available for use in evaluating this dam.

2.3 Operation Data

No engineering operational data were disclosed.

2.4 Evaluation of Data

a. Availability

There was no design or construction information available for use in connection with the inspection of this dam.

b. Adequacy

The lack of in-depth engineering data did not allow for a definitive review. Therefore, the condition of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity

Non-applicable.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. General

The field inspection of Baldwins Pond Dam was made on May 27, 1981. The inspection team consisted of personnel from Philip W. Genovese & Associates, Inc., Geotechnical Engineers, Inc., and Diversified Technologies Corporation. Inspection checklists, completed during the visual inspection, are included in Appendix A. At the time of the inspection the water level was EL 195.2 (NGVD).

b. Dam

The dam is an earthen embankment with a vertical stone masonry wall extending along about two thirds of the dam length. The main spillway for the dam is the vertical stone masonry wall along approximately the left half of the dam.

The crest on the right half of the dam is covered with riprap, small brush, weeds and trees up to 8 inch diameter which obscure the surface of the dam crest (Photos No. 1, 8, 14, 20). A 14 inch wide hole penetrating at least 18 inches into the crest was observed at the upstream side of the concrete cutoff wall for the emergency spillway near the right abutment (approximately Sta 0+25) (Photo No. 22). The hole appears to have been caused by soil erosion during periods of flow over the emergency spillway.

The left half of the dam consists of the stone masonry main spillway (Photos No. 5, & 6). Approximately the left half of the spillway crest was dry and no loose stone blocks were observed. Water was flowing over the remainder of the spillway and, therefore, the condition of the right portion of the spillway was not observed.

The upstream face of the dam, which was visible above the reservoir surface at the right side of the dam (Sta 0+00 to 1+00) was covered with riprap, weeds and trees to 8 inches in diameter (Photos No. 1, 8, and 24). Riprap was missing in many locations, most notably on the upstream side of the emergency spillway (approximately Sta 0+00 to 0+40).

Many seeps were observed along the downstream face, the most notable being four to five locations at the emergency spillway headwall (Sta 0+00 to 0+25). The seepage at this location was exiting from below the downstream riprap and previously placed concrete patch (Photos No. 2 and 3). Flow was also exiting from a gate valve controlled outlet pipe located in the emergency spillway channel (Photo 23). The estimated combined flow in the emergency spillway from all sources at this location was 50 to 100 gallons per minute and appeared clear. Florescin dye was placed in the reservoir on the upstream side of the emergency spillway and after one-half hour no dye was visible exiting from the downstream seeps.

Seepage was also observed coming through the joints in the downstream masonry wall between about Sta 0+80 to 0+95. The three largest seeps in this area had flows ranging from 1 to 5 gallons per minute (Photos 10, 11, and 12). Seepage was also observed coming through the masonry joints inside the recess adjacent to a low-level outlet consisting of a 12 inch cast iron pipe in the downstream wall to right of main spillway (Photo No 4). The flow exiting from this recess was estimated to be 2-5 gallons per minute. The left half of the downstream face of the main spillway wall which was not obscured by reservoir overflow (approximately Sta 1+30 to 1+62) was wet over most of its area. This wetness was due to seepage through the joints in the stone masonry wall (Photos No. 6 and 13). In all cases, seepage was clear and there was no evidence of any fines.

A missing stone block was observed at the tailwater pool elevation near Station 1+50.

Apparent displacement of the top 8 feet of the downstream masonry wall was observed between about Sta 0+70 to 0+95. The maximum lateral offset was approximately 10 inches and it appears that the masonry joints in this area have been recently remortared (Photos No. 4, 11, and 12).

The downstream face of the right side of the dam embankment is covered by riprap, small brush, weeds and trees to 8 inches in diameter (Photo No. 14). Evidence of erosion was noted along the downstream toe, probably due to runoff down the slope and flow in the emergency spillway discharge channel which runs along the downstream toe (Photo No. 20.)

The right abutment and right wall of the emergency spillway discharge channel was eroded, probably by flow into and through the channel (Photos No. 7, 21, and 23). The first 50-70 feet of the emergency spillway discharge channel had many gaps in the riprap along the right wall of the channel (Photo No. 23). Trees, up to 10 inches in diameter, were observed growing along the downstream bank of the channel (Photo No. 7).

Seepage was observed coming through the joints at the juncture of the main spillway masonry wall and the adjoining masonry wall along the left downstream abutment. This seepage extends from about 5 feet below the crest to the tailwater pool. (Photo No. 13).

A large area of erosion was observed along the left abutment adjacent to a 15 inch cast iron pipe evidently due to reservoir overtopping at a location about 20 to 30 feet upstream of the spillway (Photos No. 15 and 16). This eroded gully was up to 3 feet deep and approximately 5 feet wide. There was evidence that in times of high reservoir pool elevations, water overflows the bank of the reservoir, flows along the left abutment and across Westfield Road, and enters the discharge channel downstream of the Westfield Road bridge.

c. Appurtenant Structures

The main spillway is 62 feet long and consists of a stepped stone wall with stone and mortar training walls about 1.8 feet high (Photos No. 5 and 6). The left spillway face had seepage passing through it, while the right side was unobservable due to water passing over the spillway. The left spillway abutment had two tree stumps of 16 inch and 12 inch diameter protruding from it along with a 2 foot diameter by 4 inch deep hole from a displaced fence post. The right abutment had a 5 foot diameter by 1 foot deep hole in it.

There is a 19 foot long emergency spillway near the right end of the dam. This consists mainly of an 8 inch wide concrete wall surrounded by rough concrete and soil. The spillway is in poor shape and has extensive seepage passing beneath it.

There are three outlets from the dam. A 24 inch cast iron pipe exits downstream of the emergency spillway and has a gate valve control on the downstream side of the dam. On the date of the inspection there appeared to be some leakage through this outlet. A concrete headwall is in the pond just upstream of the emergency spillway and would appear to lead to this outlet. A 12 inch cast iron pipe passes through a 3 foot by 3 3/4 foot stone box outlet at the right of the main spillway. There is no evidence of a control mechanism or intake for either the pipe or the stone box outlet, but it is reportedly controlled by a key valve. Lastly, there is an intake upstream of the left spillway abutment which served the former mill and exited from a tunnel which emerges on the left side of the downstream spillway channel. This pipe is controlled by a shear gate in the pond. The condition of each of these outlets along with their associated controls could not be determined from this investigation and therefore, the capacity of each was impossible to calculate.

d. Reservoir Area

There is evidence of instability occurring along the reservoir about 20 to 30 feet upstream of the left spillway abutment. This eroded gully was about 3 feet deep and 5 feet wide. An eroded channel has formed downstream of this gully which then passes across Westfield Road to a riprapped channel on the other side of the road and from there into Harbor Brook.

e. Downstream Channel

The downstream channel downstream of the Westfield Road bridge is the natural river channel. Trees to 18 inches in diameter were observed growing along the banks of the channel (Photo No. 17).

3.2 Evaluation

Based on the visual inspection, the dam appears to be in POOR condition. The following features could adversely affect the future performance of the dam:

- a. Seepage at the headwall of the emergency spillway could lead to piping and erosion of the embankment soil and to instability of the dam at or near the right abutment.
- b. Inadequate riprap or concrete protection of the soil on the dam crest at the emergency spillway and along the emergency spillway discharge channel will lead to further erosion in this area.
- c. Seepage through the downstream stone masonry wall will lead to loosening and displacement of the cement mortar and could result in displacement of the stone blocks and/or piping of the upstream embankment soils.
- d. Overtopping of the reservoir bank upstream of the left abutment will lead to continued erosion along the left abutment.
- e. Further displacement of the downstream stone masonry wall or existence of missing masonry blocks could lead to instability of the dam embankment.
- f. The trees growing on the crest and upstream and downstream faces of the right embankment could create future seepage problems since the tree roots can provide a seepage path for

water. In addition, trees uprooted during storms can displace large quantities of embankment soils which could form channels to the reservoir pool and cause a breach of the dam.

SECTION 4

OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General

The dam impounds the water of Harbor Brook and the pond is used primarily for recreational purposes.

b. Description of any Warning System in Effect

There are no warning systems in effect at this dam.

4.2 Maintenance Procedures

a. General

The only regular work or inspection schedule is done by the Parks Department which lowers the water level each year to remove deposits from the concrete pad near the swimming area and cut brush around the pond.

b. Operating Facilities

There is no regular schedule for work or inspection of the dam.

4.3 Evaluation

The current operating and maintenance procedures for the dam are inadequate. A formal downstream warning system should be developed and put into effect in case of an emergency at the dam. Also, a program of annual technical inspections by qualified registered engineers should be instituted.

SECTION 5

EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

The watershed of Baldwins Pond Dam consists of 8.19 square miles of rolling to mountainous terrain, a significant portion of which is developed for residential and commercial uses. The remainder of the watershed is mostly wooded. The watershed also contains several water bodies, notably Bishops Pond, Black Pond and Bradley Hubbard Reservoir. The watershed elevation (NGVD) range is from 195 to 892.

The dam is basically a high spillage type of project with insignificant surcharge storage capability. The maximum impoundment to the top of the dam (EL. 196.8 NGVD) is estimated to be 40 acre-feet and estimated storage below the main spillway crest is 25 acre-feet.

The dam is classified as small in size having a significant hazard potential.

5.2 Design Data

No hydraulic or hydrologic design data could be found for this dam.

5.3 Experience Data

The maximum discharge at this dam site is unknown and no information was found to indicate that there have been any serious problems arising at the dam. However, it is reported that an unauthorized cut through the right embankment was made during construction of the Harbor Brook sewer project in April 1975. It is also reported that the left embankment was breached. According to an eye witness account the dam was overtopped during the heavy precipitation of January 1979; however, no damage to any house was reported.

5.4 Test Flood Analysis

Based upon the Army Corps of Engineer's "Preliminary Guidance for Estimating Maximum Probable Discharges", dated March 1978, the watershed classification (rolling to mountainous) and a drainage area of 8.19 square miles, a PMF of 15,600 cfs or 1900 cfs per square mile, is

estimated at the dam site. In accordance with Table 3 of Corps of Engineer's Recommended Guidelines, the range of test flood to be considered is from the 100 year to the 1/2 PMF for a small size dam with significant hazard classification. Based upon the involved downstream risk potential, a 100 year test flood is selected.

The peak inflow to the pond at the selected test flood is estimated to be 4100 cfs and the peak outflow is estimated to be 4035 cfs with maximum pool elevation at 199.2 NGVD. Since the top of the dam elevation is 196.8 NGVD, the dam is overtopped by 2.4 feet for the test flood condition. The maximum surcharge height above main spillway crest is estimated to be 4.2 feet. The main spillway capacity with pool at top of dam and test flood conditions is 450 cfs and 1600 cfs which is equivalent to 11% and 40% of the routed test flood outflow respectively. The emergency spillway capacity at top of dam and test flood pool elevation is 40 cfs and 325 cfs which is equivalent to 1% and 8% respectively.

5.5 Dam Failure Analysis

The Brookside Park is located approximately 3200 feet below the dam and is designated as the impact area (Sheet D-1). This park is divided in two parts by the Harbor Brook and has several bridge crossings. In addition to this impact area, the two bridges on Westfield Road would also be impacted upon failure of the dam.

Utilizing the Corps of Engineers April 1978 "Rule of Thumb Guidance for Estimating Downstream Failure Hydrographs", the peak failure outflow due to dam breach is estimated to be 5000 cfs, with an estimated flood depth of 6.8 feet immediately downstream of the dam. The breach width is estimated to be 47 feet, which is assumed to include a major part of the main spillway. The flood routing was performed for peak failure outflow with pool at top of dam with an elevation of 196.8 NGVD. The pre-failure flow at the impact area is estimated to be 574 cfs causing a depth of 3.5 feet in the brook. After failure, the flood stage is estimated to increase to a depth of 5 feet, resulting in a peak flow of 1350 cfs.

The rapid 1.5 feet rise in the Harbor Brook at the impact will raise the flood stage to elevation 145.0 NGVD, with an increase in the brook velocity to 5 fps and inundate a major portion of Brookside Park. The park is actively used and therefore represents a potential for loss of a few lives due to dam failure. In addition, the two bridges on Westfield Road have inadequate capacities and potential for damage exists. The first bridge located only 40± feet below the dam is estimated to have a capacity of 1120 ± cfs, whereas the peak outflow is estimated to be 4850+ cfs, having a velocity of 8.3 fps. The second bridge on Westfield Road located 1150± feet downstream of the dam is estimated to have 830+ cfs, whereas the peak outflow is 3400+ cfs, having a velocity of 5.0 fps.

Based upon the hydraulic/hydrologic analysis (Appendix D) and the potential for loss of a few lives, the dam has a significant hazard classification.

SECTION 6

EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

The visual inspection did not disclose any immediate stability problems of the dam. The seepage through the downstream masonry wall and at the emergency spillway is indicative of seepage through and under the dam which, if not controlled, could lead to failure of the dam by piping.

Based on this visual inspection alone, it is not possible to determine the character of the dam foundation or materials contained within the cross section of the dam. Therefore, it is not possible to evaluate the circumstances causing the apparent displacement of the downstream wall and the resulting factor of safety of the dam against overturning and sliding.

6.2 Design and Construction Data

There were no design and construction data available relative to the stability of the dam.

6.3 Post-Construction Changes

A letter dated July 7, 1973 from Victor F. Galgowski, Superintendent of Dam Maintenance for the State of Connecticut, to Abraham S. Grossman, Mayor of Meriden, Connecticut presents the findings of an engineer's inspection report of Baldwins Pond Dam. According to this letter the findings were:

1. The west (left) abutment was breached and there was evidence of flow around the abutment.
2. Cap stones on the west (left) abutment have broken and shifted toward the pond.
3. A section of the dam, east (right) of the spillway, has been partially breached, forming a secondary spillway.
4. Stone masonry, just east (right) of the spillway and next to the old outlet, has moved outward creating a reverse batter of 12 inches.

5. Masonry on the face of the spillway has come loose and is allowing water passage through the joints.

Therefore, it appears that in 1973 many of the adverse conditions observed during this Phase I Inspection were also present.

Enclosed with Galgowski's letter was an Order issued by Douglas M. Costle, Acting Commissioner of the Department of Environmental Protection for Connecticut, to Mayor Grossman to engage an engineer to design repairs and for the City to obtain a construction permit and initiate repairs to the dam. The repairs were required to be completed by July 1, 1974.

According to newspaper clippings from the Meriden Journal and Meriden Record of April 4, 1975, the dam was breached by an unauthorized cut made by a contractor constructing a nearby sewer line. The cut was evidently made at the location of Finding 3 noted in Galgowski's July 7, 1973 letter, which is also the present location of the emergency spillway headwall. The flow through the breach evidently followed the present emergency spillway channel and caused extensive damage to Westfield Road and the adjoining sidewalk because of undermining due to erosion. The present concrete cutoff wall at the emergency spillway headwall and the riprap in the spillway channel were evidently installed in order to repair this breach.

A Connecticut Superior Court Judgment was issued on August 13, 1979 in the case of Joseph N. Gill, Commissioner of Environmental Protection for Connecticut, vs City of Meriden. This judgement required that by May 1, 1980, the City of Meriden comply with the Commissioner's Order dated July 7, 1973, regarding design of repairs for Baldwins Pond Dam and that the repairs be completed by May 1, 1981.

An Interdepartment Message dated May 2, 1980 from Victor Galgowski to Richard Webb, Connecticut Assistant Attorney General, indicated that as of that date the City of Meriden was awaiting proposals for the engineering studies.

6.4 Seismic Stability

Baldwins Pond Dam is located in Seismic Zone 1 and, in accordance with the Corps of Engineer's Guidelines, does not warrant further seismic analysis at this time.

SECTION 7

ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

Based on the visual inspection and review of available information, the dam appears to be in poor condition.

b. Adequacy of Information

The information is such that the assessment of the long-term performance of the dam with respect to soils and geology must be based on the visual inspection.

c. Urgency

In accordance with the existing court order, the recommendations and remedial measures described below should be implemented immediately upon receipt of this Phase I Inspection Report by the owner.

7.2 Recommendations

The owner should retain the services of a qualified engineer to investigate the following problems and to design appropriate repairs to correct these problems:

1. The seepage exiting at the emergency spillway headwall and through the downstream masonry wall of the dam.
2. The displacement of the downstream masonry wall.
3. Inadequate riprap at the emergency spillway, along the emergency spillway channel, and on the upstream face of the dam.
4. Overtopping of the reservoir bank at the left abutment and subsequent erosion around the left abutment.

5. The removal of the trees and other vegetation on the crest and upstream and downstream face of the dam and along the spillway channel, and proper backfilling and protection of the areas of vegetation removal.
6. Perform a detailed hydrologic and hydraulic study to assess further the potential and ability to withstand overtopping and the need for and the means to increase project discharge capacity.
7. Determine the location and operability of the low level outlet works passing through the dam and determine the need for and means of providing sufficient outlet capacity and controls.

7.3 Remedial Measures

a. Operating and Maintenance Procedures

1. The owner should maintain the proper vegetation on the dam, consisting of grass and/or riprap for protection against erosion.
2. Start a program of daily checking the condition of the dam and monitoring the seepage exiting at the emergency spillway headwall and through the downstream masonry wall of the dam.
3. Establish a surveillance program for use during and immediately following periods of heavy rainfall and also a downstream warning program to follow in case of emergency conditions.
4. Engage a professional engineer qualified in the design and construction of dams to make an annual comprehensive technical inspection of the dam.

7.4 Alternatives

A legitimate alternative would be to have the dam removed under the direction of a qualified engineer.

APPENDIX A

INSPECTION CHECKLIST

**VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION**

PROJECT BALDWINS POND DAM
Meriden, CT

DATE: May 27, 1981

TIME A.M.

WEATHER Fair - 70°F

W.S. ELEV. 195.2 **U.S.** **DN.S.**

PARTY:

- | | |
|-----------------------------------|--------------------------------|
| 1. <u>Pratap Patel - Genovese</u> | 6. <u> </u> |
| 2. <u>Walt Gancarz - Genovese</u> | 7. <u> </u> |
| 3. <u>R.F. Murdock - GEI</u> | 8. <u> </u> |
| 4. <u>J.G. Engels - GEI</u> | 9. <u> </u> |
| 5. <u>Murali Atluru - DTC</u> | 10. <u> </u> |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>Structural</u>	<u>Pratap Patel, Walt Gancarz</u>	
2. <u>Geotechnical</u>	<u>Richard F. Murdock, J.G. Engels</u>	
3. <u>Hydraulic</u>	<u>Murali Atluru</u>	
4. <u> </u>	<u> </u>	
5. <u> </u>	<u> </u>	
6. <u> </u>	<u> </u>	
7. <u> </u>	<u> </u>	
8. <u> </u>	<u> </u>	
9. <u> </u>	<u> </u>	
10. <u> </u>	<u> </u>	

PERIODIC INSPECTION CHECKLIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Dam Embankment

NAME _____

DISCIPLINE Geotechnical

NAME Engels/Murdock

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT</u>	
Crest Elevation	195.0
Current Pool Elevation	195.2
Maximum Impoundment to Date	Unknown
Surface Cracks	Riprap present on crest. Therefore, surface not generally visible. 14 inch wide hole upstream of emergency spillway cutoff wall.
Pavement Condition	No pavement.
Movement or Settlement of Crest	None discernible.
Lateral Movement	Possible lateral movement of downstream masonry wall to right of center spillway. Wall bulging up to 10 inches has been re-mortared previously.
Vertical Alignment	Fair.
Horizontal Alignment	Fair.
Condition at Abutment and at Concrete Structures	Left Abutment - signs of overtopping 30 feet upstream from crest. Right abutment and right wall of emergency spillway channel exhibit some downstream erosion.
Indications of Movement of Structural Items on Slopes	No structures on slopes.
Trespassing on Slopes	None evident.

PERIODIC INSPECTION CHECKLIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Dam Embankment

NAME _____

DISCIPLINE Geotechnical

NAME Engels/Murdock

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT (CONT'D)</u>	
Sloughing or Erosion of Slopes or Abutments	Left abutment 20 feet upstream of crest. Evidence of flow around left abutment and across downstream roadway. Erosion on downstream slope right side of dam due to flow in emergency spillway.
Rock Slope Protection - Riprap Failures	Riprap covering most of downstream face on right side of dam.
Unusual Movement or Cracking at or Near Toe	None observed.
Unusual Embankment or Downstream Seepage	Large seep at right emergency spillway headwall from beneath riprap and concrete patch. Flow just downstream of gate valve may be discharge from intake. Total estimated flow 50-100 gpm. Flow appears clear. Numerous seeps through joints in downstream masonry wall to right of center spillway. Largest seeps at 12 feet right of spillway, 10 feet below crest (2-4 gpm); at low level outlet (2-5gpm); 8 feet below crest (1-2 gpm). Downstream masonry wall to left of spillway wet from 5 feet below crest to downstream pool.
Piping or Boils	None observed.
Foundation Drainage Features	None observed.
Toe Drains	None observed.
Instrumentation System	None observed.
Vegetation	Trees to 8 inches in diameter on crest and upstream and downstream slopes on right side of dam.

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Dike Embankment

NAME _____

DISCIPLINE _____

NAME _____

AREA EVALUATED

CONDITION

DIKE EMBANKMENT

No dike present.

Crest Elevation

Current Pool Elevation

Maximum Impoundment to Date

Surface Cracks

Pavement Condition

Movement or Settlement of Crest

Lateral Movement

Vertical Alignment

Horizontal Alignment

Condition at Abutment and at Concrete Structures

Indications of Movement of Structural Items on Slopes

Trespassing on Slopes

Sloughing or Erosion of Slopes or Abutments

Rock Slope Protection - Riprap Failures

Unusual Movement or Cracking at or near Toes

Unusual Embankment or Downstream Seepage

Piping or Boils

Foundation Drainage Features

Toe Drains

Instrumentation System

Vegetation

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Outlet Works - Intake

NAME _____

DISCIPLINE Geotechnical/Structural

NAME Engels/Murdock/Patel/
Gancarz

AREA EVALUATED

CONDITION

OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE

a. Approach Channel/

Slope Conditions

Bottom Conditions

Rock Slides or Falls

Log Boom

Debris

Condition of Concrete Lining

Drains or Weep Holes

b. Intake Structure

Condition of Concrete

Stop Logs and Slots

None visible. All 3 possible intakes
are under water.

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Outlet Works - Control Tower NAME _____

DISCIPLINE Structural

NAME Patel/Gancarz

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - CONTROL TOWER</u>	None
a. Concrete and Structural	
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System	

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Outlet Works - Conduit

NAME _____

DISCIPLINE Structural

NAME Patel/Gancarz

AREA EVALUATED

CONDITION

OUTLET WORKS - TRANSITION AND CONDUIT

None Visible.

General Condition of Concrete

Rust or Staining on Concrete

Spalling

Erosion or Cavitation

Cracking

Alignment of Monoliths

Alignment of Joints

Numbering of Monoliths

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Outlet Works - Outlet Str. / Channel NAME

DISCIPLINE Structural

NAME Patel/Gancarz

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	3 feet x 3 feet, 9 inches. Stone box outlet with 12 inch cast iron pipe passing through it.
General Condition of Concrete	No
Rust or Staining	No
Spalling	No
Erosion or Cavitation	No
Visible Reinforcing	No
Any Seepage or Efflorescence	Seepage 2-5 gpm
Condition at Joints	Fair
Drain holes	None visible.
Channel	
Loose Rock or Trees Overhanging Channel	Some trees - further downstream.
Condition of Discharge Channel	Fair.

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE Spillway Weir

NAME _____

DISCIPLINE Geotechnical/Structural/Hydraulic

NAME Engels/Murdock/Patel/
Gancarz/Atluru

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	
General Condition	Under water, not observable.
Loose Rock Overhanging Channel	None observed.
Trees Overhanging Channel	None observed.
Floor of Approach Channel	Under water, not observed.
b. Weir and Training Walls	
General Condition of Concrete	Fair.
Rust or Staining	No
Spalling	No
Any Visible Reinforcing	No
Any Seepage or Efflorescence	No
Drain Holes	None observed.
c. Discharge Channel	
General Condition	Right side of dam. Fair.
Loose Rock Overhanging Channel	Some loose riprap on sides of emergency spillway channel.
Trees Overhanging Channel	Brush and trees to 10 inches in diameter along emergency spillway channel.
Floor of Channel	Trees to 18 inches in diameter downstream of downstream roadway overpass.
Other Obstructions	6 inch diameter tree at right overpass abutment upstream of overpass. Emergency spillway riprap from about 50 feet downstream of headwall to main outlet channel. Main channel under water and not visible.
	None observed.

PERIODIC INSPECTION CHECK LIST

PROJECT BALDWINS POND DAM

DATE May 27, 1981

PROJECT FEATURE _____

NAME _____

DISCIPLINE Structural

NAME Patel/Gancarz

AREA EVALUATED	CONDITION
<p><u>OUTLET WORKS - SERVICE BRIDGE</u></p> <p>a. Super Structure</p> <p> Bearings</p> <p> Anchor Bolts</p> <p> Bridge Seat</p> <p> Longitudinal Members</p> <p> Under Side of Deck</p> <p> Secondary Bracing</p> <p> Deck</p> <p> Drainage System</p> <p> Railings</p> <p> Expansion Joints</p> <p> Paint</p> <p>b. Abutment & Piers</p> <p> General Condition of Concrete</p> <p> Alignment of Abutment</p> <p> Approach to Bridge</p> <p> Condition of Seat & Backwall</p>	<p>None.</p>

APPENDIX B

ENGINEERING DATA

EMERGENCY SPILLWAY

201.9 EROSION
24" C.I.P.
INV. 1909 (approx)

14" HOLE

Trees & Brush

BULGE AREA

12" C.I.P.
INV. 18565

Trees

Riprap

196.4

199.37

188' Emg. Spilly Ch.

INV.

196.28

201.23

WESTFIELD

El. 215

205

195

185

175

Emergency Spillway

Sta. 0160

BULGE AREA

195.57

185.57

BALDWIN'S POND

OVERTOPPING AREA
EROSION

3'x3'-9" Box Culvert

Main Spillway

STONE BLOCK
MISSING AT
WATER LEVEL

Approx. Inv
El 179.0

Main Spillway Channel

12" C.I.P

Exposed
15" C.I.P.
(Purpose unknown)

● - INDICATES AREA OF

CL&P#1319

Low Bridge Steel - El. 19245

Inv. 190.40

15" R.C.P.

Inv. 193.93

C.B.

ROAD

PLAN

SCALE: 1" = 20'

Sta 1+00

Main Spillway

WET

Low Level
Outlet - 12" C.I.P.

Sta 1+62

196.74

196.77

195.60

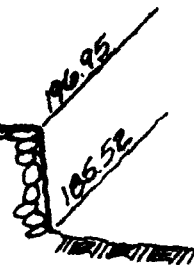
SECTION AA

SCALE: HOR 1" = 20' VERT 1" = 20'

PHILIP W. I
ENGINEERS

DOWN)

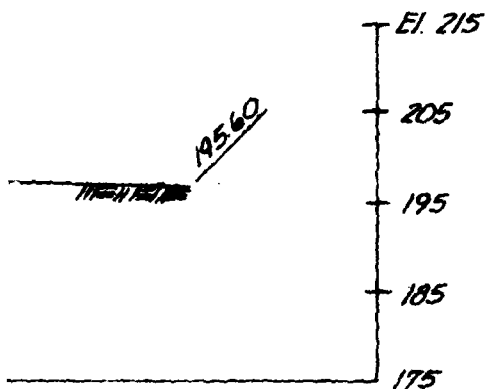
ML 19320 (3/29/81)



SECTION BB
SCALE: HOR 1"=20' VERT 1"=20'

INDICATES AREA OF SEEPAGE

14.25



NOTES REFER TO EXISTING CONDITION ON
MAY 27, 1981

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS

HAMDEN, CONNECTICUT

BALDWIN'S POND DAM

B-1

3

BUCK & BUCK
ENGINEERS

88 WADSWORTH STREET, HARTFORD, CONNECTICUT 06106

JAMES A. THOMPSON
ROBINSON W. BUCK
LAWRENCE F. BUCK

HENRY WOLCOTT BUCK
1931-1963
ROBINSON D. BUCK
1933-1939

COMM. 5713-77

April 19, 1973

Mr. Victor Galgowski, Supt. of Dams,
Water & Related Resources Section,
Department of Environmental Protection,
State Office Building,
Hartford, Connecticut 06106

WATER & RELATED
RESOURCES
RECEIVED

APR 25 1973

Re: Baldwin Pond Dam,
Meriden

ANSWERED _____
REFERRED _____
FILED _____

Dear Vic:

We inspected the subject dam on April 12th and found it to be in very poor condition. The following deficiencies were noted.

1. The west abutment was breeched and there was evidence of flow around the abutment.
2. Cap stones on the west abutment, between the spillway and the breach, have broken loose and shifted away from the abutment toward the pond.
3. A section of the dam, east of the spillway, has been partially breeched, forming a secondary spillway.
4. Stone masonry, just east of the spillway and next to the old outlet, has moved outward or downstream, creating a reverse batter with an overhang of 12". The wall is out of plumb 9" in 6 feet.
5. Water is squirting from the face of the spillway, indicating the masonry is coming loose and allowing clear water passage through the joints.

This structure is not safe. We recommend that the owner be notified of its condition and that he furnish an engineering report on proposed repairs.

Sincerely,

BUCK & BUCK


James A. Thompson

JAT:fb

B-2

10 May 1973

Abraham G. Grossman, Mayor
City Hall
Meriden, Connecticut 06450

Re: Baldwin Pond Dam
Meriden

Dear Mayor Grossman:

According to records in this office the subject dam is owned by the City of Meriden.

Under Section 25-110 of the General Statutes, a copy of which is enclosed, this department has jurisdiction over all dams "--which by breaking away or otherwise might endanger life or property". This dam could cause damage in the event of failure and is therefore under the jurisdiction of this department.

This dam was recently inspected and found to be in an unsafe condition. The following deficiencies were noted:

1. The west abutment was breached and there was evidence of flow around the abutment.
2. Cap stones on the west abutment have broken loose and shifted toward the pond.
3. A section of the dam, east of the spillway, has been partially breached, forming a secondary spillway.
4. Stone masonry, just east of the spillway and next to the old outlet, has moved outward, creating a reverse batter of 12".
5. Masonry on the face of the spillway has come loose and is allowing water passage through the joints.

You are requested to engage an engineer registered in this state to investigate the overall safety of the dam and to submit plans for the necessary repairs. Such repairs should include, but not necessarily be limited to, the

B-3

Abraham G. Grossman, Mayor

Page 2

above mentioned items.

Will you please notify this office within two weeks your plans to place this dam in a safe condition.

At your service,

Dan W. Lufkin
Commissioner

Enclosure
Sent Certified Mail

B-4

7 July 1973

Honorable Abraham G. Grossman
City Hall
Meriden, Connecticut 06450

Re: Baldwin Pond Dam
Meriden

Dear Mayor Grossman:

According to records in this office, the subject dam located south of Westfield Road in the city of Meriden is owned by the city.

Section 13 of Public Act No. 571 of the 1971 Session of the General Assembly places under the jurisdiction of the Commissioner of Department of Environmental Protection all dams "--which, by breaking away or otherwise, might endanger life or property". This dam could cause damage in the event of failure and is therefore under the jurisdiction of this department.

In accordance with Section 25-111 of the General Statutes, this dam was recently inspected and found to be in an unsafe condition. The statute states in part: "If after any inspection described herein, the Commissioner finds any structure to be in an unsafe condition, he shall order the person, firm, or corporation owning or having control thereof, to place it in a safe condition or to remove it, and shall fix the time within which such order shall be carried out".

Section 14 of Public Act No. 571 states in part: "Before any person, firm, or corporation construct, alters, adds to, replaces, or removes any such structure, such person, firm, or corporation shall apply to the Commissioner for a permit to undertake such work".

Finding

Based on the engineer's report covering the inspection of this dam, the Commissioner of the Department of Environmental Protection finds the structure to be unsafe due to the following conditions:

1. The west abutment was breached and there was evidence of flow around the abutment.
2. Cap stones on the west abutment have broken and shifted toward the pond.
3. A section of the dam, east of the spillway, has been partially breached, forming a secondary spillway.
4. Stone masonry, just east of the spillway and next to the old outlet, has moved outward, creating a reverse batter of 12".

Honorable Abraham G. Grossman

Page 2

5. Masonry on the face of the spillway has come loose and is allowing water passage through the joints.

In view of the preceding findings the enclosed Order has been issued by the Commissioner.

Very truly yours,

Victor F. Galgowski
Supt. of Dam Maintenance
Water & Related Resources

VFG:ljg

Enclosure
Sent Certified Mail

B-6

7 July 1973

Honorable Abraham G. Grossman
City Hall
Meriden, Connecticut 06450

Re: Baldwin Pond Dam
Meriden

Dear Mayor Grossman:

Order

In accordance with Section 25-111 of the General Statutes you are hereby ordered to make repairs or alterations necessary to place the Baldwin Pond Dam in a safe category or to remove the structure.

Any repairs or alterations to the structure or its removal shall be carried out in accordance with engineering plans and specifications prepared by an engineer registered in the State of Connecticut and submitted to this department for approval and for the issuance of a permit prior to any construction or demolition work in accordance with Section 14 of Public Act No. 571 of the 1973 Session of the General Assembly.

Engineering plans for the repair or removal of the dam shall be submitted to October 1, 1973 and the repair or removal of the dam accomplished by July 1, 1974.

Very truly yours,

Douglas M. Costle
Acting Commissioner

B-7

STATE OF CONNECTICUT

No. 199434 4

JOSEPH N. GILL, COMMISSIONER
OF ENVIRONMENTAL PROTECTION,
Hartford, Connecticut

v.

CITY OF MERIDEN, Meriden,
Connecticut

: SUPERIOR COURT
:
: JUDICIAL DISTRICT OF HARTFORD-
: NEW BRITAIN at HARTFORD
:
:
:

: AUGUST 13, 1979

PRESENT, HONORABLE LEO PARSKEY, JUDGE

J U D G M E N T

This action, by writ and complaint, claiming injunctive relief and damages came to this court on November 4, 1975 and thence to the present time when the parties files a written stipulation that judgment be entered as hereinafter set forth.

The Court, having reviewed the written stipulation finds that judgment should be entered in accordance with the stipulation.

WHEREFORE, it is adjudged that

1. Within 6 months from the approval or disapproval of a certain grant application to repair the Baldwin Pond Dam but in any case no later than May 1, 1980, the City of Meriden shall do the following:

(a) Contract with an engineering firm for a report on the work necessary to repair said dam and comply with the

Commissioner's order dated July 7, 1973.

(b) Submit said report to the Department of Environmental Protection for its consideration and review together with an application for a construction permit to do all work recommended in said report, and necessary to comply with the Commissioner's order dated July 7, 1973.

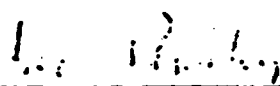
(c) Obtain Department of Environmental Protection approval of the construction permit and issuance of the construction permit to do all work recommended in said report and necessary to comply with the Commissioner's order dated July 7, 1973.

2. Within twelve months from the issuance of the construction permit, but in any case no later than May 1, 1981, the City of Meriden shall do the following:

(a) Complete all the work recommended in the engineering report and necessary to comply with the Commissioner's order dated July 7, 1973.

(b) Certify to the Commissioner of Environmental Protection that all work on the dam has been completed and that the City of Meriden is in full compliance with the Commissioner's order dated July 7, 1973. and with this judgment.

BY THE COURT


Honorable Leo Parskey, Judge

Interdepartment Message

STO-201 REV. 7/79 STATE OF CONNECTICUT
(Back No. 6938-051-01)

SAVE TIME: *Handwritten messages are acceptable.*
Use carbon if you really need a copy. If typewritten, ignore faint lines.

To	NAME	Richard Webb	TITLE	Assistant Attorney General	DATE	2 May 1980
	AGENCY	Attorney General's Office	ADDRESS			
From	NAME	Victor E. Galgowski	TITLE	Supt. of Dam Maintenance	TELEPHONE	
	AGENCY	Water Resources Unit	ADDRESS			
SUBJECT Baldwin Pond Dam - Meriden						

According to an August 13, 1979 judgment issued by the Superior Court, the City of Meriden was to have submitted an engineering report for our consideration and an application for a construction permit by May 1, 1980.

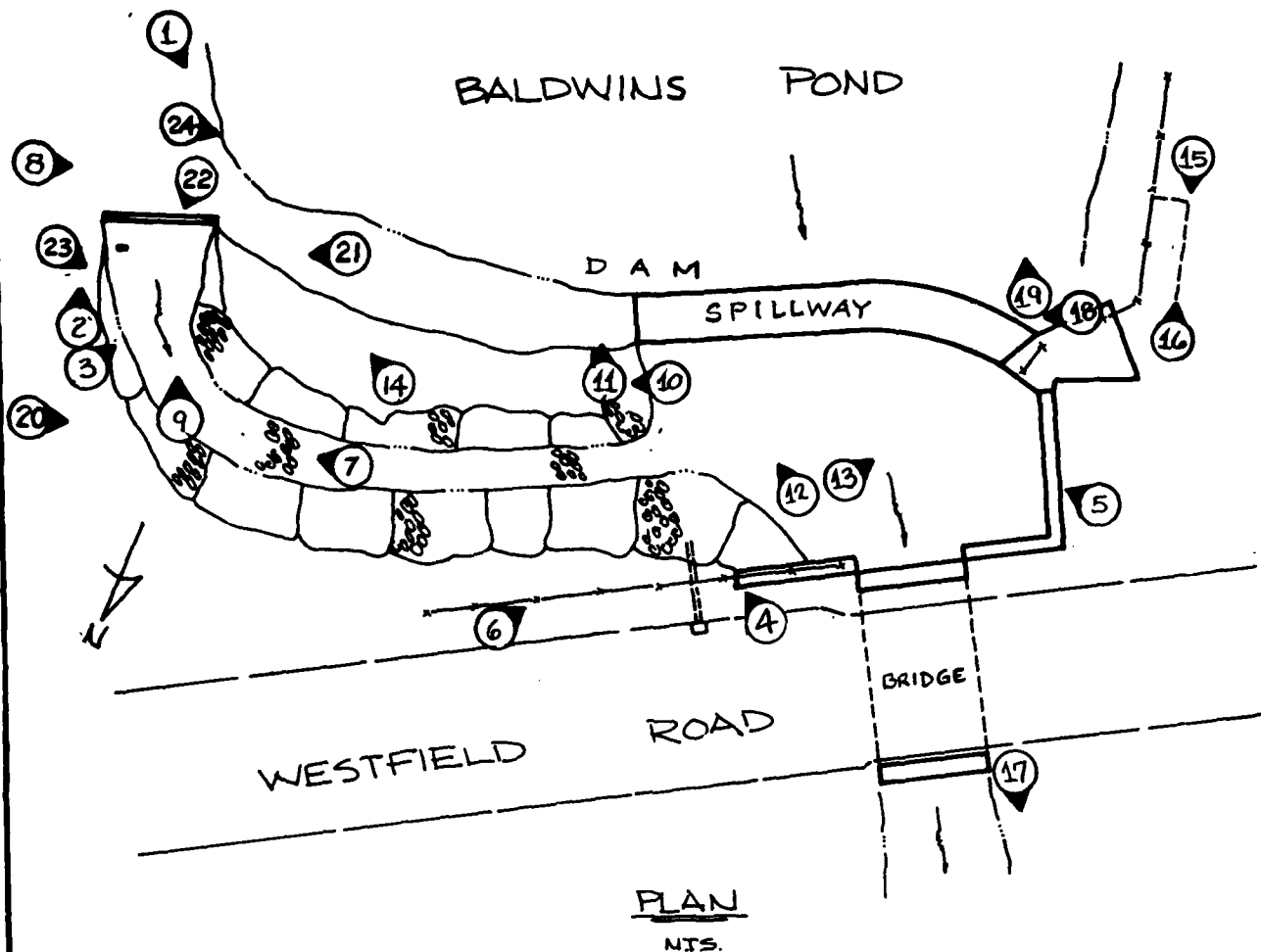
A phone call to the City Engineer on May 1 revealed they were awaiting proposals from a number of firms for the engineering studies. He claimed the city was under the impression they had more time in which to present plans to our unit. He gave no firm commitment as to when we might expect them.

VFG:ijk

B-10

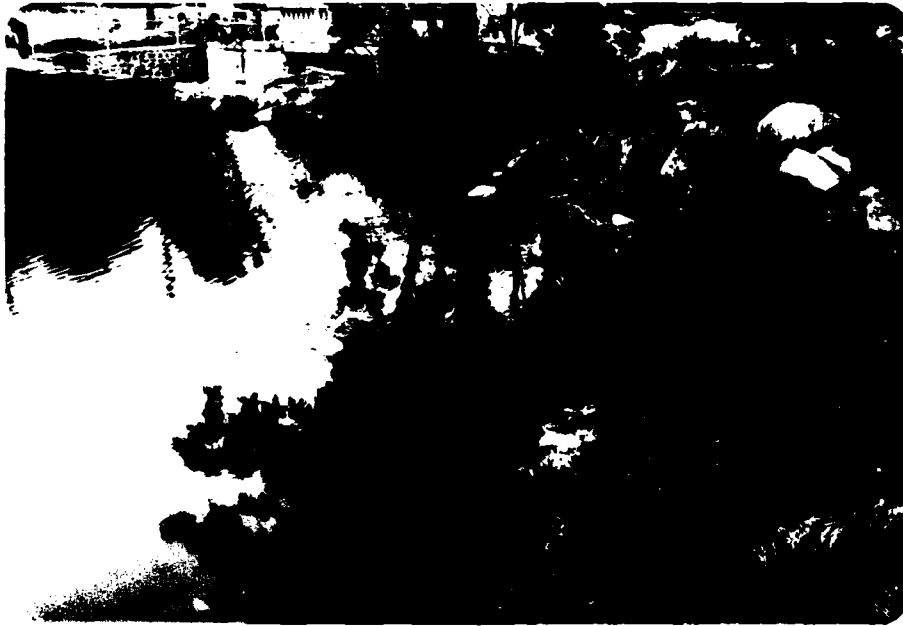
APPENDIX C

PHOTOGRAPHS



③ REFERS TO PHOTO NUMBER,
LOCATION AND DIRECTION

<p>U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.</p>	<p>NATIONAL PROGRAM OF INSPECTION OF NON-FED DAMS</p>	<p>PHOTO LOCATION PLAN</p> <p>BALDWIN'S POND DAM</p> <p>HARBOR BROOK</p> <p>MERIDEN CONNECTICUT</p>
<p>PHILIP W. GENOVESE AND ASSOCIATES, INC. ENGINEERS HAMDEN, CT.</p>		



1. Upstream face of dam looking toward left abutment.



2. Seepage at toe of emergency spillway, flow clear, estimate seepage of 50-100 gallons per minute, total from all sources; rule extended 4 feet. Note outlet control.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



3. Seepage at toe of emergency spillway.



4. Downstream face of dam to right of spillway, blocks displaced up to 10 inches; seepage below lower block 1-2 gallons per minute. Note stone box outlet.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



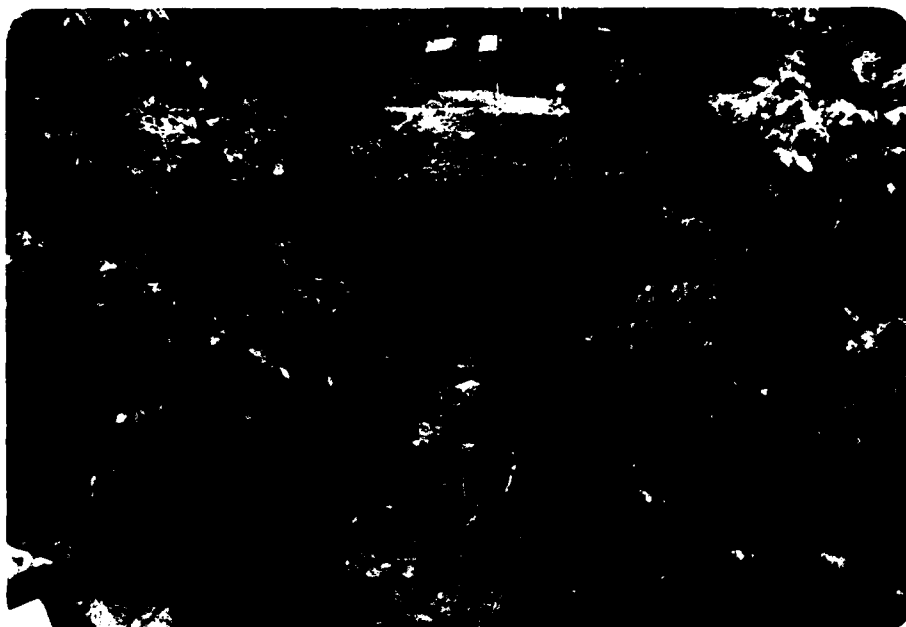
5. Spillway and downstream face of dam.



6. View of left side of spillway adjacent to abutment.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



7. Discharge channel for emergency spillway.



8. View along crest of dam from right abutment; trees on dam up to 9 inches in diameter.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



9. View of downstream face of emergency spillway.



10. Seepage adjacent to base of wall, 2-4 gallons per minute.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



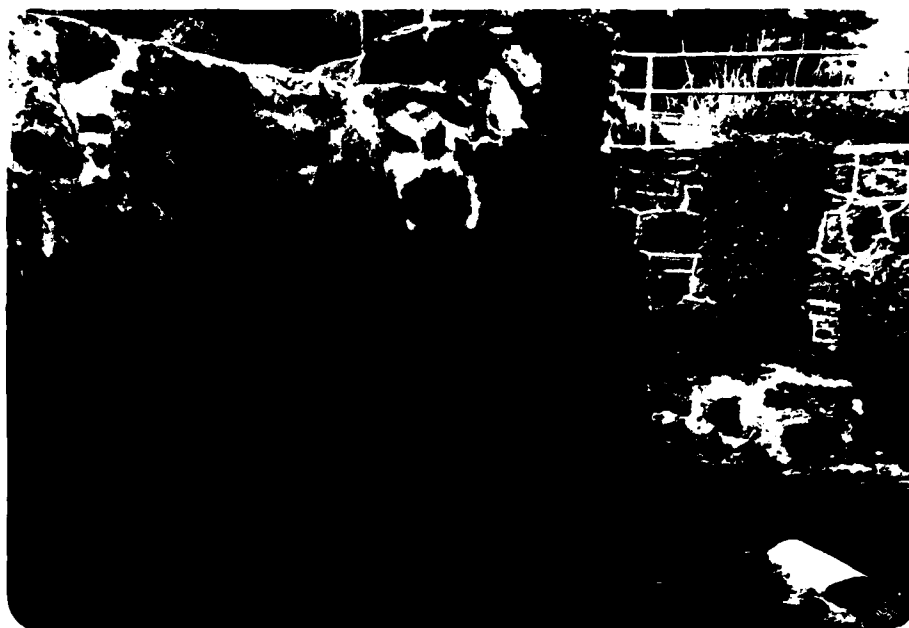
11. Close-up of displacement of downstream masonry wall, up to 10 inches lateral movement.



12. Downstream face of masonry wall to right of spillway.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



13. Seepage along downstream face near left abutment.



14. Downstream face of dam.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS
HAMDEN, CONNECTICUT

BALDWINS POND DAM



15. Area of erosion on left abutment upstream of spillway. .



16. Area of erosion on left abutment upstream of spillway
adjacent to 15-inch cast iron pipe.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



17. Discharge channel downstream from bridge.



18. Upstream face of dam from left abutment.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



19. Reservoir Area.



20. Downstream face of dam from right abutment; erosion on downstream slope as result of flow in emergency spillway.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



21. Erosion adjacent to right abutment. Note gate valve control in channel.



22. Hole, 18 inches deep, 14 inches wide, just upstream from emergency spillway.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM



23. View along emergency spillway. Note gate valve control.



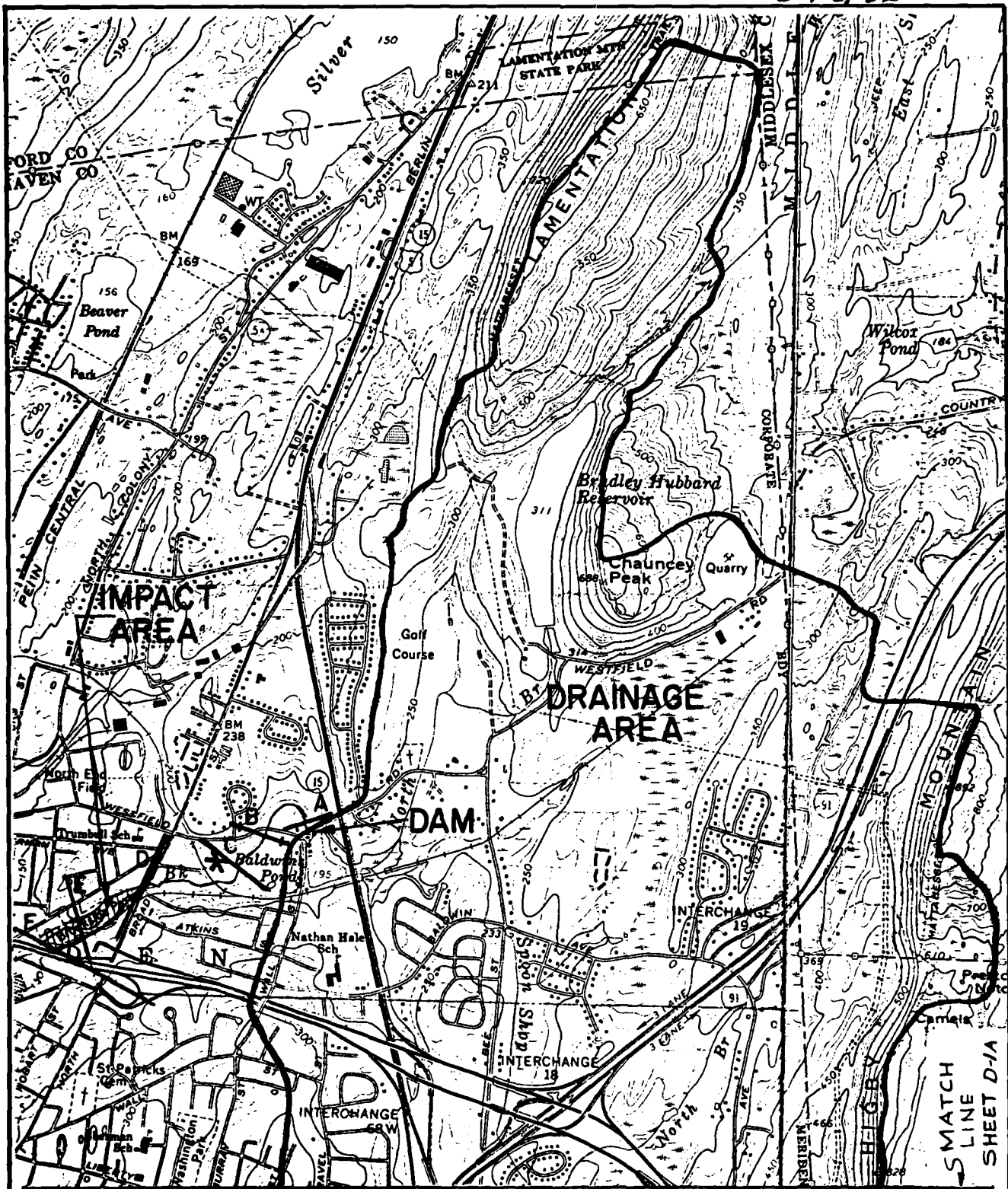
24. Area of erosion on left abutment.

PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS HAMDEN, CONNECTICUT

BALDWINS POND DAM

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS



0 2000 4000 FT.

SCALE

DRAINAGE & IMPACT AREA

MERIDEN, WALLINGFORD AND MIDDLETOWN QUADS

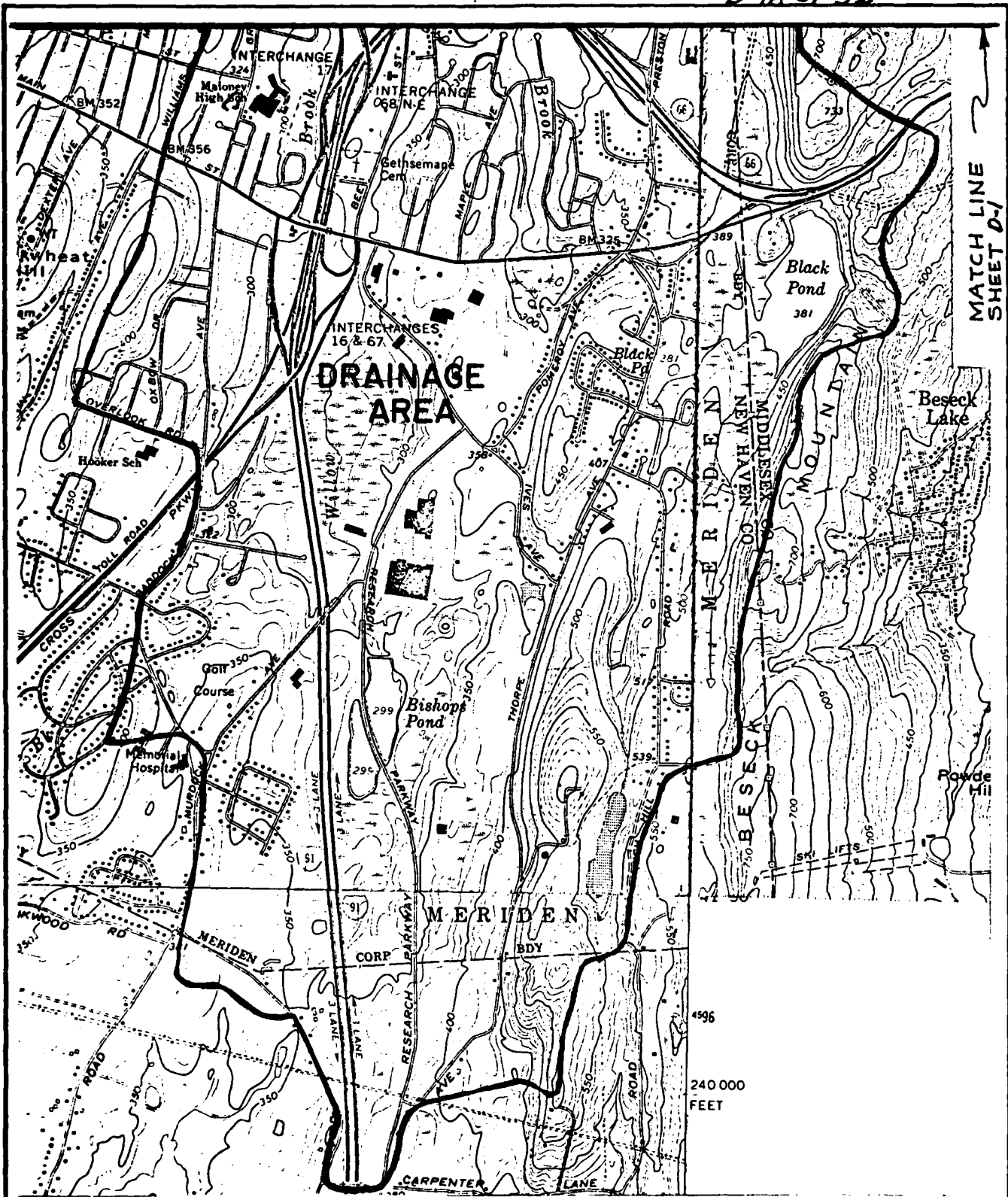
DRAINAGE AREA = 8.19 SQ. M.



PHILIP W. GENOVESE & ASSOCIATES, INC.
ENGINEERS

HAMDEN, CONNECTICUT

BALDWIN'S POND DAM

SMATCH
LINE
SHEET D-1A



<div>N</div> <div></div>	<div>020004000FT.</div> <div></div> <div>SCALE</div>	<div>DRAINAGE & IMPACT AREA</div> <div>MERIDEN, WALLINGFORD AND MIDDLETOWN QUADS</div> <div>DRAINAGE AREA = 8.19 SQ. M.</div>	
<div>PHILIP W. GENOVESE & ASSOCIATES, INC.</div> <div>ENGINEERS</div> <div>HAMDEN, CONNECTICUT</div>		<div>BALDWINS</div> <div>POND</div> <div>DAM</div>	

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-2 OF 32
NEW ENGLAND DIVISION COMPUTED BY MA DATE 6/5/81
BALDWIN SPOND DAM CHECKED BY EB DATE 6/6/81

PERFORMANCE AT PEAK FLOOD CONDITIONSPROBABLE MAXIMUM FLOOD (PMF) DETERMINATION

DRAINAGE AREA - 8.19 SQ. MI FROM CONN. DEP BULLETIN
 NO. 1, 1972 (GAZETTEER OF NATURAL
 DRAINAGE AREAS, P. 48)

WATERSHED CLASSIFICATION - "ROLLING" TO "MOUNTAINOUS"
 BASED UPON USGS MAP AND SITE VISIT. THE WATERSHED
 INCLUDES SEVERAL PONDS E.G. BISHOPS POND, BLACK
 POND AND BRADLEY HUBBARD RESERVOIR. A SIGNIFICANT
 PORTION OF THE WATERSHED IS DEVELOPED FOR
 RESIDENTIAL USE.

PMF PEAK INFLOW-

FROM THE CORPS OF ENGINEERS DEC. 1977 PEAK FLOW RATES
 GUIDE CURVES FOR A DRAINAGE AREA OF 8.19 SQ. MI.
 FOR THE ABOVE DESCRIBED WATERSHED CLASSIFICATION.

THE SELECTED INTENSITY = 1900 CFS/SQ. MI.
 ∴ PMF PEAK INFLOW = $1900 \times 8.19 = 15,560$ CFS
 SAY 15,600 CFS.

SIZE CLASSIFICATION-

FOR THE PURPOSE OF DETERMINING PROJECT SIZE, THE
 MAXIMUM STORAGE ELEVATION IS CONSIDERED EQUAL
 TO THE TOP OF DAM.

TOP OF DAM = EL 196.8* NGVD

TOE OF DAM = EL 181.3

H.T. OF DAM 15.5 FT.

* The W.S. Elevation of 195 MSL on the Meriden Quad Sheet
 (1972) is assumed to be the spillway crest elevation on
 National Geodetic Vertical Datum (NGVD). All other
 elevations are referenced to this assumed elevation
 and are obtained based upon information furnished by
 P.W. Genovese & Assoc. Inc.

DIVERSIFIED TECHNOLOGIES CORP.

CONSULTING ENGINEERS
NORTH HAVEN, CONN.

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-3 OF 32
NEW ENGLAND DIVISION COMPUTED BY IMB DATE 6/5/81
BALDWINSPOND DAM CHECKED BY EB DATE 6/6/81

PLANIMETERING FROM USGS MAP FOR POND SURFACE AREAS

AT EL. 195 (NORMAL W.S. EL) = 5.5 ACRES

AT EL. 200 = 21.1 ACRES

A STAGE-POND AREA CURVE IS PLOTTED

FROM THIS CURVE, POND AREA AT TOP OF DAM (196.8) = 11.2 AC.

AVERAGE POND AREA BET. SPILLWAY CREST AND

TOP OF DAM = 8.35 AC.

∴ STORAGE BETWEEN SPILLWAY CREST AND TOP OF DAM

= $1.8 \times 8.35 \approx 15$ AC.FT.

ESTIMATED STORAGE BELOW SPILLWAY CREST = $\frac{1}{3} bh$

= $\frac{1}{3} \times 5.5 \times (195 - 191.3)$

≈ 25 AC.FT.

∴ MAXIMUM IMPOUNDMENT TO TOP OF DAM = $15 + 25 = 40$ AC.FT.

A STAGE-STORAGE CURVE IS PLOTTED ON SHEET 3.

THE BALDWIN POND DAM IS CLASSIFIED AS

SMALL IN THIS ANALYSIS. IT IS NOTED HOWEVER,

THAT ACCORDING TO CORPS OF ENGINEERS

GUIDELINES A DAM IS INCLUDED IN THE DAM

INSPECTION PROGRAM IF IT IS 25' OR MORE

IN HEIGHT OR HAS AN IMPOUNDMENT CAPACITY

OF 50 ACRE- FEET OR MORE.

SHEET D-4 OF 32

MB 6/5/81

EB 6/6/81

SURFACE AREA - ACRES

22 20 18 16 14 12 10 8 6 4 2 0

STAGE STOPPED

STAGE AREA

TOP OF THE DAM

BALDWIN POND DAM

STORAGE ABOVE SPILLWAY CREST - AC.FT.

80

70

60

50

40

30

20

10

0

ELEVATION IN FEET

201

199

197

195

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-5 OF 32
NEW ENGLAND DIVISION COMPUTED BY MA DATE 6/5/81
BALDWIN SPOND DAM CHECKED BY EB DATE 6/6/81

HAZARD POTENTIAL - SIGNIFICANT HAZARD POTENTIAL
BASED UPON DAM BREACH ANALYSIS AND RELATIVE
LOCATION OF BROOKSIDE PARK AND OTHER STRUCTURES.
A DETAILED DISCUSSION OF FAILURE HAZARD POTENTIAL
IS INCLUDED AT THE END OF BREACH ANALYSIS
SECTION OF APPENDIX -D

SELECTION OF TEST FLOOD -
FOR THE SMALL SIZE AND SIGNIFICANT HAZARD
POTENTIAL CLASSIFICATION, TABLE 3 OF CORPS OF
ENGINEERS RECOMMENDED GUIDELINES, THE TEST
FLOOD COULD BE IN THE 100 YR TO 1/2 PMF
RANGE.

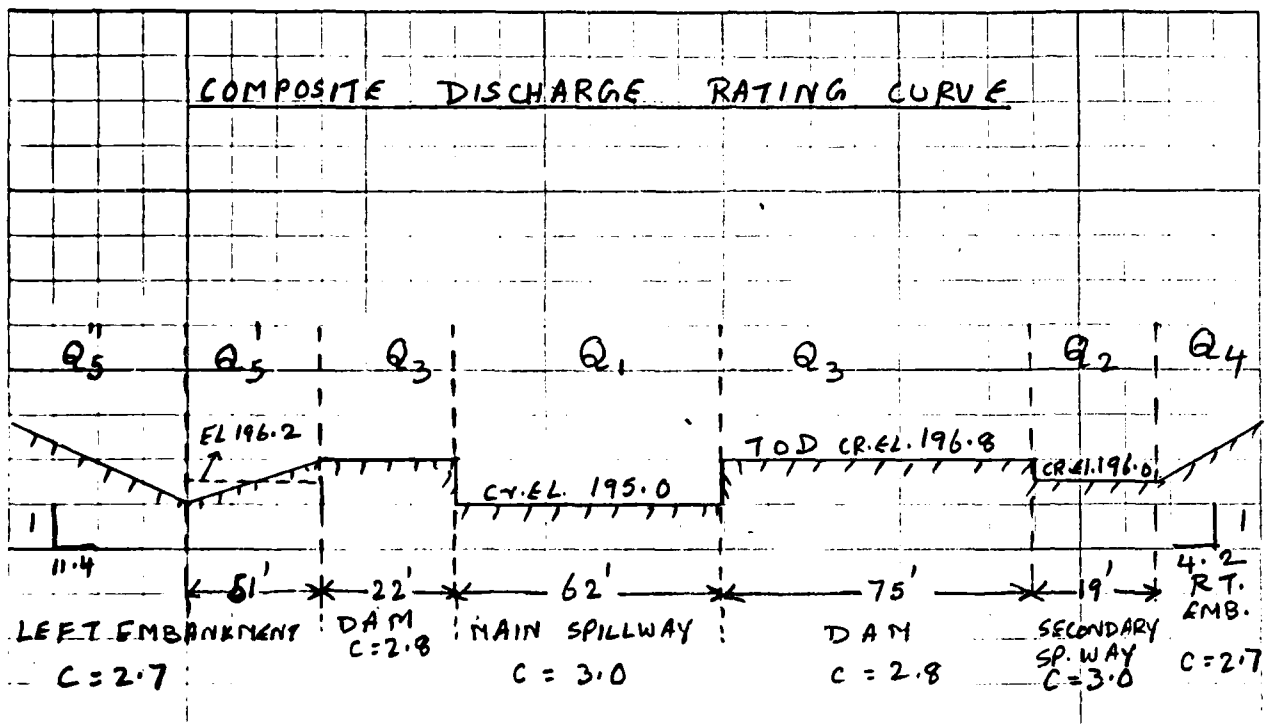
BASED UPON THE INVOLVED RISK POTENTIAL
DOWNSTREAM OF THE DAM, ^{THE} LOWER END OF THIS
RANGE IS SELECTED. 1

TEST FLOOD = 100 YR.

TEST FLOOD PEAK INFLOW = $\frac{5}{19} \times 15,600 \approx 4100$ CFS

NOTE: PMF OF 15,600 CFS IS ESTIMATED TO RESULT FROM
19" RUN-OFF AND A 100 YR FLOOD IN
CONNECTICUT IS ESTIMATED TO RESULT FROM
APPROXIMATELY 5" RUN-OFF.

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-6 OF 32
NEW ENGLAND DIVISION COMPUTED BY MA DATE 6/8/81
BALDWIN'S POND DAM CHECKED BY EB DATE 6/9/81



APPROXIMATE POTENTIAL OVERFLOW PROFILE

(Based upon PW Genovese & Assoc Inc Field information)

MAIN SPILLWAY

$$Q_1 = CLH^{3/2}$$

$$= 186 H^{3/2}$$

CR EL = 195.0, $L = 62'$, $C = 3.0$ Broad crested weir (Per Fig. 7 of USGS Book 3, Chapter A 5 of "Measurements of Peak Discharge at Dams by Indirect Methods", 1968)

SECONDARY SPILLWAY

$$Q_2 = CLH^{3/2}$$

$$= 57 H^{3/2}$$

CR EL = 196.0 (Average) $L = 19'$, $C = 3.0$
(Concrete Broad crested weir)

DAM

$$Q_3 = CLH^{3/2}$$

$$= 271.6 H^{3/2}$$

CR EL = 196.8, $L = 97'$
 $C = 2.8$ (Broad crested, Uneven)

**CONSULTING ENGINEERS
NORTH HAVEN, CONN.**

PROJECT NO. 81-21-11 SHEET D-7 OF 32

COMPUTED BY:

DATE 6/8/81

CHECKED BY:

DATE 6/9/81

$$Q_4 = \frac{2}{5} CL \frac{(h_b^{5/2} - h_a^{5/2})}{(h_b - h_a)}$$

$$= 0.4 \times 2.7 \times 4.2 \times h_b^{5/2}$$

$$= \underline{4.54 h_b^{5/2}}$$

Sec. Sp. cv G1. 1960

$C = 2.7$, assumed

Ch. El = 196.0 , ha = 0 upto El. 201.9

$$A'_g = C L H^{3/2} = 2.7 \times 51 \times H^{3/2} \quad C = 2.7 \text{ assumed}$$

$$CLH = 196.2$$

$$= 137.7 H^{3/2}$$
[illegible]
$$Q_5'' = \frac{2}{3} CL \left(\frac{h_b^{5/2} - h_a^{5/2}}{(h_b - h_a)} \right)^* \\ = 0.4 \times 2.7 \times 11.4 \times h_b^{5/2} \\ = 12.3 h_b^{5/2}$$

$C_{r, £1} = 195.68$ & $C = 2.7$ assumed

$$Q_5 = Q_5' + Q_5''$$

OUTLET PIPE WITH GATE VALVE (located at the secondary sp. way)

$$Q_b = C A \sqrt{2gH}$$

24" size assumed

$$H = 196.8 - 191.8 = 5$$

= 56 CFS neglecting losses

* USGS RECOMMENDED FORMULA FOR MORE PRECISE
DISCHARGE OVER INCLINED DAM/ EMBANKMENT CRST.
(REF: MEASUREMENT OF PEAK DISCHARGES AT DAM
BY INDIRECT METHODS. USGS BOOK B,
CHAPTER A-5, PAGE 3-4, 1968)

DIVERSIFIED TECHNOLOGIES CORP.

CONSULTING ENGINEERS
NORTH HAVEN, CONN.

PROJECT NON FEDERAL DAM INSPECTION

PROJECT NO. 81-21-11

SHEET D-8 OF 32

NEW ENGLAND DIVISION

COMPUTED BY

MA

DATE

6/8/81

BALDWIN'S POND DAM

CHECKED BY

EB

DATE

6/7/81

TABULATION OF DISCHARGE RATES (CFS)

	ELVN NGVD	MAIN SP. WAY Q_1	SEC. SP. WAY Q_2	DAM Q_3	RT. EMB Q_4	LE. EMB Q_5' Q_5''	$Q_5 = Q_5' + Q_5''$	TOTAL Q
MAIN SP. CR	195.0	0	0	0	0	0	0	0
	196.0	186	0	0	0	1	1	187
TOP	196.8	450	40	0	2	63	19	574
	198.0	966	161	357	25	332	109	1950
	199.0	1488	296	886	70	449	262	3451
TEST FLOOD	199.2	1600	325	1010	83	715	302	4035
	199.3	1658	341	1073	89	751	323	4235

NOTE: CONSIDERING THE ABOVE OVERFLOW CAPACITIES, THE DISCHARGE CAPACITY OF A PIPE OUTLET WITH GATE VALVE BELOW THE SECONDARY SPILLWAY IS NEGLECTED SINCE ITS CAPACITY WITH POOL AT TOP OF DAM IS ESTIMATED TO BE ONLY 56 CFS.

DISCHARGE RATING CURVES FOR TOTAL Q (COMPOSITE) AND SPILLWAY ARE PLOTTED.

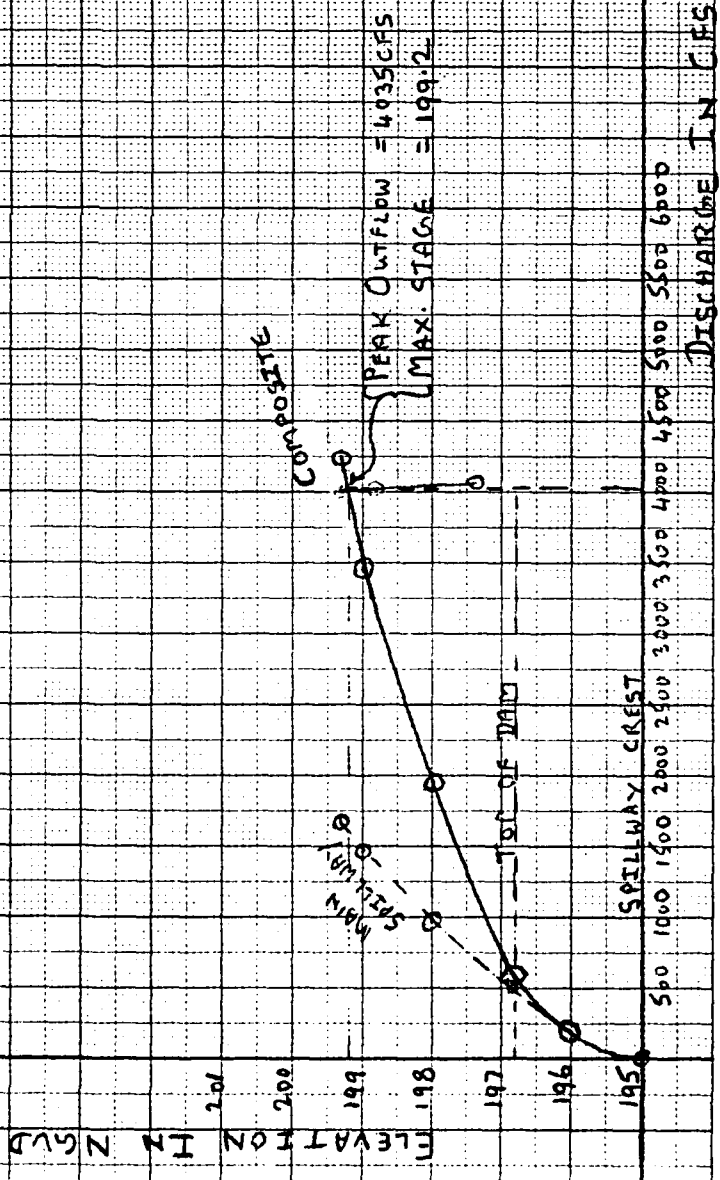
SHEET D-9 OF 32

MA 6/8/81

EB 6/9/8

BALDWIN POND DAM

DISCHARGE RATING CURVES



DIVERSIFIED TECHNOLOGIES CORP.

CONSULTING ENGINEERS
NORTH HAVEN, CONN.

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET 10 OF 32
NEW ENGLAND DIVISION COMPUTED BY MWT DATE 6/8/81
BALDWINS POND DAM CHECKED BY EB DATE 6/9/81

DETERMINATION OF PEAK OUTFLOW

SHORTCUT ROUTING OF RESERVOIR'S CORPS OF ENGINEERS
GUIDELINES "SURCHARGE STORAGE ROUTING" ALTERNATE
METHOD USED

FOR 4100 CFS (100 YR) THE DISCHARGE RATING CURVE
GIVES ELVN = 199.25

AND FROM STAGE-STORAGE CURVE FOR THIS ELVN
STORAGE = 52 AC.FT.

$$STOR_i = \frac{52 \times 12}{8.19 \times 640} = 0.12" \text{ RUN-OFF.}$$

$$Q_{P_i} = Q_{P_i} \left(1 - \frac{STOR_i}{5}\right)$$

①	②	③	④	⑤
STOR: INCH $\left(1 - \frac{STOR_i}{5}\right)$	STOR: AC.FT	Q_{P_i} CFS	ELVN FROM STORAGE	
	① $\times 8.19 \times 640$	② $\times 4100$ CURVE USING ③		
	12			
0.05	0.99	22	4060	197.35
0.10	0.98	44	4018	198.85
0.12	0.976	52	4000	199.25

COLUMNS ④ & ⑤ ARE PLOTTED ON DISCHARGE RATING
CURVE AND,

$$\text{PEAK OUTFLOW } Q = 4035 \text{ CFS}$$

$$\text{MAXIMUM STAGE} = 199.2 \text{ NGVD}$$

$$\text{TOP OF DAM} = 196.8 \text{ NGVD}$$

∴ THE DAM IS OVERTOPPED BY 2.4 FT.

PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-11 OF 32
NEW ENGLAND DIVISION COMPUTED BY MA DATE 6/5/81
BALDWIN'S POND DAM CHECKED BY EB DATE 6/6/81

BREACH ANALYSIS - DOWNSTREAM FAILURE HAZARD
BASED UPON CORPS OF ENGINEERS "RULE OF THUMB"
GUIDELINES FOR ESTIMATING D/S DAM FAILURE
HYDROGRAPHS.

$$\text{BREACH OUTFLOW } Q_b = \frac{8}{27} \times W_b \times \sqrt{g} \times Y_0^{3/2}$$

WATER DEPTH AT TIME OF FAILURE $Y_0 = 15.5$ FEET WITH
POOL AT TOP OF DAM
ESTIMATED BREACH WIDTH $W_b = 40\%$ OF MID-HT LENGTH
OF DAM

MID-HEIGHT LENGTH OF DAM = 118'

$$\therefore W_b = 0.4 \times 118 = 47'$$

(MID-HT LENGTH IS BASED UPON P.W. GENOVESE & ASSOC
INC'S FIELD INFORMATION)

$$\therefore Q_b = \frac{8}{27} \times 47 \times \sqrt{32.2} \times (15.5)^{3/2} \approx 4820 \text{ CFS}$$

$$\begin{aligned} \text{PEAK FAILURE OUTFLOW } Q_p &= Q_b + \text{SEC. SP. WAY} + \text{MAIN SP. WAY}^* \\ &\quad \text{LOW LEVEL OUTLET} \\ &= 4820 + 40 + 109 + 56 = 5025 \text{ CFS} \\ \text{SAY } &5000 \text{ CFS.} \end{aligned}$$

$$\begin{aligned} \text{ESTIMATED FAILURE FLOOD DEPTH} &\approx 0.44 Y_0 \\ \text{IMMEDIATELY D/S FROM DAM} &\approx 0.44 \times 15.5 \\ &\approx 6.8 \text{ FT.} \end{aligned}$$

* ASSUMING 47' BREACH OCCURS IN THE 62' MAIN
SPILLWAY, THE DISCHARGE OVER THE REMAINING 15'
SPILLWAY IS ESTIMATED TO BE $\frac{15}{62} \times 450 = 109 \text{ CFS}$

PROJECT NON FEDERAL DAM INSPECTION

PROJECT NO 81-21-11

SHEET 12 OF 32

NEW ENGLAND DIVISION

COMPUTED BY

MA

DATE

6/5/81

BALDWIN'S POND DAM

CHECKED BY

EB

DATE

6/6/81

PERFORM DIS ROUTING OF PEAK FAILURE OUTFLOW

SECTION AA IS SELECTED 100' D/S OF THE DAM IMMEDIATELY NORTH OF WESTFIELD ROAD.

$$Q = 1.486 AR^{2/3} A^{1/2} \quad n = 0.06 \text{ (cobles, boulders) assumed}$$

$$= 1.707 AR^{2/3} \quad S = 0.027 \text{ Est. from PWG field inform}$$

ELVN	A	P	R	$R^{2/3}$	Q CFS
178.6	0				0
180	70	100	0.7	0.79	225
183	460	160	2.88	2.02	3780
184	630	180	3.5	2.3	5240

FROM STAGE AREA AND STAGE-DISCHARGE CURVES, FOR SECTION AA, FOR $Q_1 = 5.000$ CFS, ELVN = 183.8 AND AREA = 590 SQ. FT.

$$\text{VOLUME OF REACH } V_1 = \frac{100 \times 590}{43.560} \cong 1.3 \text{ AC. FT.}$$

$$\text{TRIAL } Q_2 = Q_1 \left(1 - \frac{V_1}{S}\right), \text{ WHERE } S = \text{STORAGE TO TOP OF DAM}$$

$$= 5.000 \left(1 - \frac{1.3}{40}\right) \cong 4850 \text{ CFS}$$

FOR THIS Q_2 THE STAGE-DISCHARGE CURVE GIVES ELVN = 183.75 AND AREA = 585 SQ. FT.

$$\text{VOLUME OF REACH } V_2 = \frac{100 \times 585}{43.560} \cong 1.3 \text{ AC. FT.}$$

$$\text{RECOMPUTING } Q_2 = Q_1 \left(1 - \frac{V_1}{S}\right) = 5.000 \left(1 - \frac{1.3 + 1.3}{40}\right) \cong 4850 \text{ CFS}$$

FLOOD STAGE AT SECTION AA = 183.75 NGVD.

$$\text{FLOOD DEPTH AT SECTION AA} = 183.75 - 178.6 \cong 5.2 \text{ FT}$$

$$\text{VELOCITY AT SECTION AA} = \frac{4850}{585} \cong 8.3 \text{ FPS}$$

NO HAZARD POTENTIAL TO THE HOUSE AT THIS SECTION, SINCE THE BASEMENT IS ESTIMATED TO BE 7' ± ABOVE STREAM BED. HOWEVER, THE WESTFIELD RD. BRIDGE IS EXPECTED TO BE IMPACTED DUE TO THE LARGE FLOW WITH HIGH VELOCITY. (THE CAPACITY OF THE BRIDGE IS ESTIMATED TO BE ONLY 1120 CFS.)

SHEET D-13 OF 32

MA 6/5/87

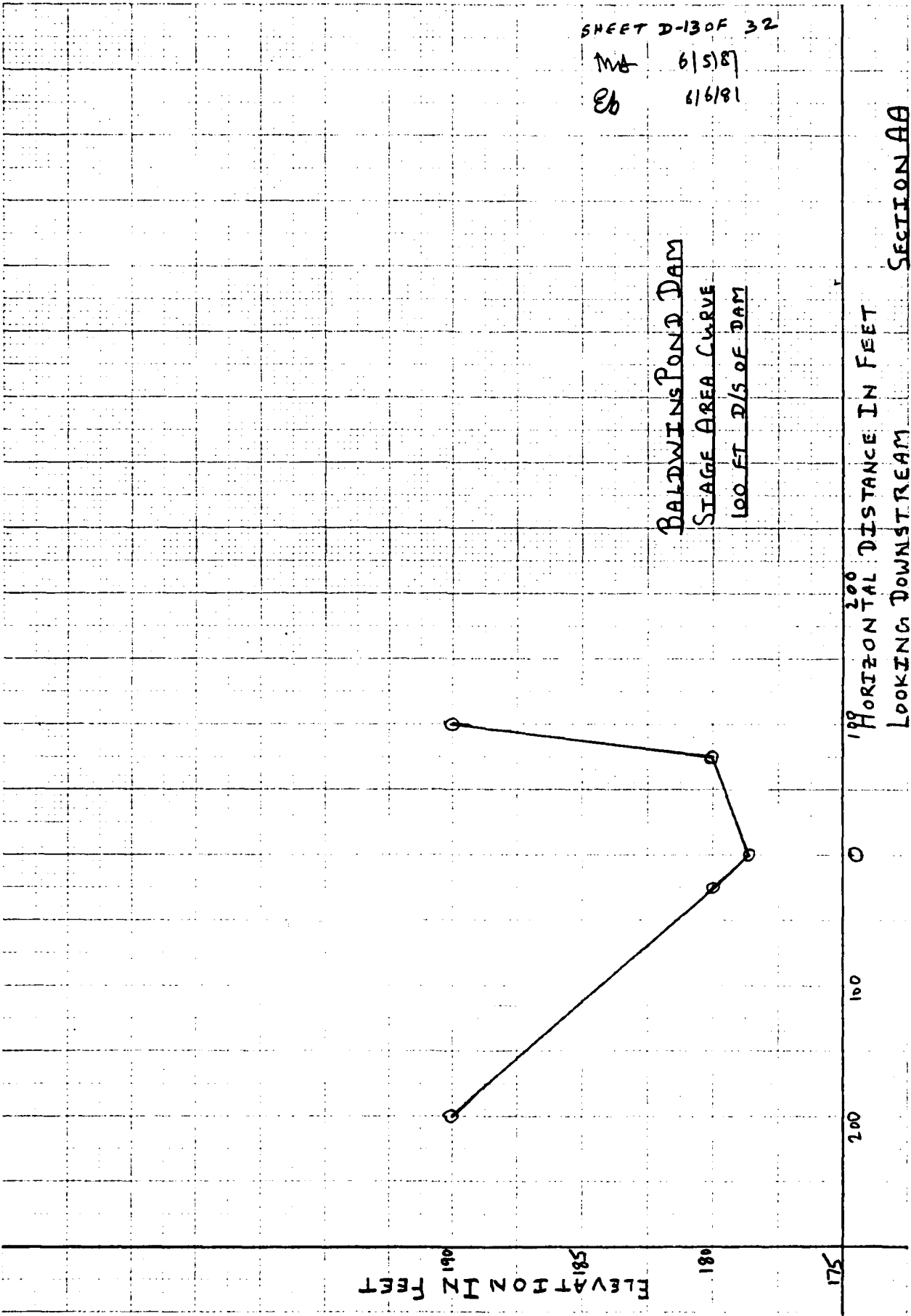
EB 6/6/81

BALDWIN'S POND DAM
STAGE AREA CURVE
100 FT D/S OF DAM

SECTION AA

HORIZONTAL DISTANCE IN FEET
LOOKING DOWNSTREAM

ELEVATION IN FEET



SHEET D-14 OF 32

MA 6/5/81

EB 6/6/81

BALDWINSPOND DAM
STAGE DISCHARGE CURVE

SECTION AA

DISCHARGE IN CFS

8000

6000

4000

2000

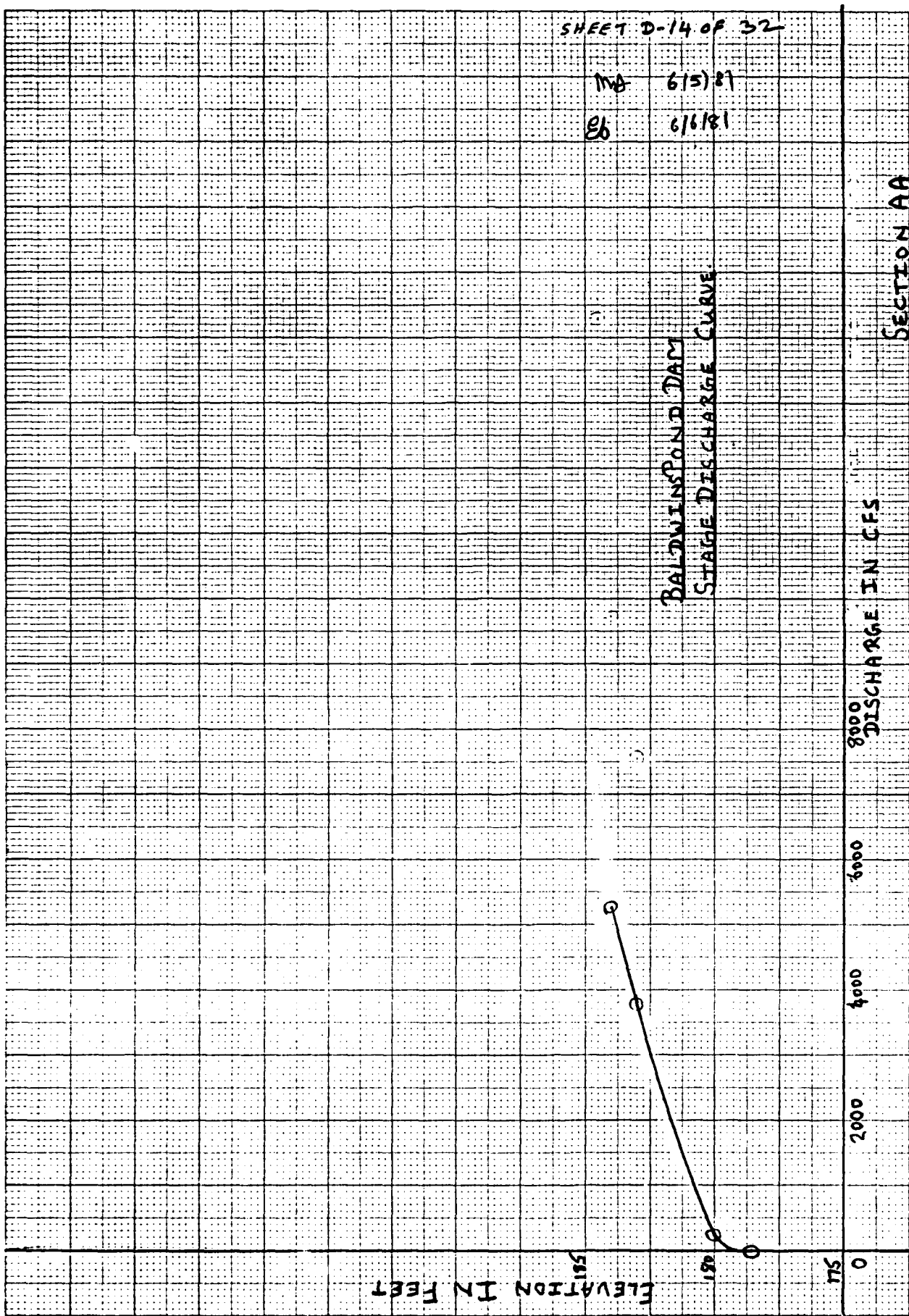
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ELEVATION IN FEET

180

170

160



PROJECT NON FEDERAL DAM INSPECTION

PROJECT NO 81-21-11

SHEET D-15 OF 32

NEW ENGLAND DIVISION

COMPUTED BY MB

DATE 6/5/81

BALDWIN'S POND DAM

CHECKED BY Eb

DATE 6/6/81

SECTION BB

THIS SECTION IS SELECTED 1050 D/S OF SECTION AA.
HOWEVER, THE REACH LENGTH IS ASSUMED TO BE 700'
BASED ON TOPOGRAPHICAL CONDITIONS.

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$$= \frac{1.486}{0.06} A R^{2/3} S^{1/2}$$

$$= 2.215 A R^{2/3} S^{1/2}$$

n = 0.06 (windy, brush) assumed
S = 0.008 Est. from USGS map

ELVN	A	P	R	R ^{2/3}	Q CFS
170	0	—	—	—	0
172	65	65	1	1	145
174	260	130	2	1.6	920
176	585	195	3	2.07	2,680
178	1040	260	4	2.5	5,760

FROM STAGE AREA AND STAGE-DISCHARGE CURVES, FOR
SECTION BB —

FOR Q_{P1} = 4,850 CFS, ELVN = 177.5 AND AREA = 895 SQ. FT.
VOLUME OF REACH V₁ = $\frac{700 \times 895}{43.560} \approx 14 \text{ AC} \cdot \text{FT}$

TRIAL Q_{P2} = Q_{P1} (1 - $\frac{V_1}{40}$) = 4,850 (1 - $\frac{14}{40}$) \approx 3,150 CFS
FOR THIS Q_{P2} THE STAGE-DISCHARGE CURVE GIVES ELVN = 176.4
AND AREA = 656 SQ. FT.

VOLUME OF REACH V₂ = $\frac{700 \times 656}{43.560} \approx 10 \text{ AC} \cdot \text{FT}$

RECOMPUTING Q_{P2} = Q_{P1} (1 - $\frac{V_1}{40}$) = 4,850 (1 - $\frac{14+10}{40}$) \approx 3,400 CFS

FLOOD STAGE AT SECTION BB = 176.6 NGVD

FLOOD DEPTH AT SECTION BB = 176.6 - 170 = 6.6 FT

VELOCITY AT SECTION BB = $\frac{3,400}{7.12} \approx 5 \text{ FPS}$

NO HAZARD POTENTIAL TO THE HOUSE AT THIS SECTION, SINCE THE 1ST
FLOOR IS ESTIMATED TO BE 8'± ABOVE THE STREAM BED. THE CULVERT
AT THIS SECTION WILL BE IMPACTED; IT'S ESTIMATED CAPACITY
BEING ONLY 830 CFS.

SHEET D-18 OF 32

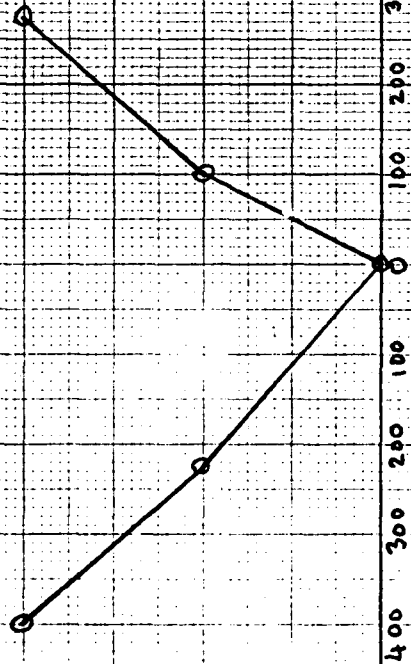
Md 6/5/81

Ed 6/6/81

BALDWINSPOND DAM
STAGE AREA CURVE
1050 FT D/S OF SECTION AA

HORIZONTAL DISTANCE IN FEET
LOOKING DOWNSTREAM
SECTION BB

ELEVATION IN FEET



SHEET D-17 OF 32

Md 6/5/81

Ob 6/6/81

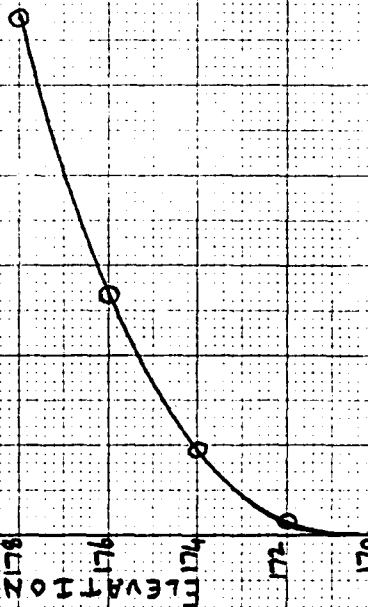
BALDWIN POND DAM
STAGE DISCHARGE CURVE

SECTION 88

DISCHARGE IN CFS

0 1000 2000 3000 4000 5000 6000

ELEVATION IN FEET
170 172 174 176 178



PROJECT NON FEDERAL DAM INSPECTION PROJECT NO 81-21-11 SHEET D-18 OF 32

NEW ENGLAND DIVISION

COMPUTED BY MA

DATE 6/5/81

BALDWIN POND DAM

CHECKED BY EB

DATE 6/6/81

SECTION CC

THIS SECTION IS SELECTED 650' D/S OF SECTION BB
ADJACENT TO THE WESTFIELD MANOR.

USING MANNING'S EQUATION

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$$= 1.75 A R^{2/3}$$

$n = 0.06$ (cobles, brush, windy) assumed
 $S = 0.005$ Est. from USGS map

ELVN	A	P	R	$R^{2/3}$	Q CFS
166.8	0	-	-	-	0
170	400	250	1.6	1.37	960
171	672	295	2.3	1.74	2,045
172	990	340	2.9	2.03	3,515

FROM STAGE AREA AND STAGE-DISCHARGE CURVES, FOR
SECTION CC

FOR $Q_1 = 3,400$ CFS, ELVN = 171.95 AND AREA = 972 SQ. FT.
VOLUME OF REACH $V_1 = \frac{650 \times 972}{43,560} \approx 14$ AC-FT.

TRIAL $Q_2 = Q_1 \left(1 - \frac{V_1}{S}\right) = 3,400 \left(1 - \frac{14}{40}\right) \approx 2,200$ CFS
FOR THIS Q_2 THE STAGE-DISCHARGE CURVE GIVES ELVN = 171.45
AND AREA = 810 SQ. FT.

VOLUME OF REACH $V_2 = \frac{650 \times 810}{43,560} \approx 12$ AC-FT.

TRIAL $Q_2 = Q_1 \left(1 - \frac{V_1}{S}\right) = 3,400 \left(1 - \frac{14+12}{40}\right) \approx 2,300$ CFS

FLOOD STAGE AT SECTION CC = 171.5 NGVD

FLOOD DEPTH AT SECTION CC = 171.5 - 166.8 = 4.7 FT

VELOCITY AT SECTION CC = $\frac{2,300}{820} \approx 3$ FPS

THE WESTFIELD MANOR HEALTH CARE CENTER IS NOT
EXPECTED TO BE IMPACTED, SINCE IT IS ESTIMATED
TO BE 12.7' ABOVE THE STREAM BED.

SHEET D-19 OF 32

MA 6/5/81

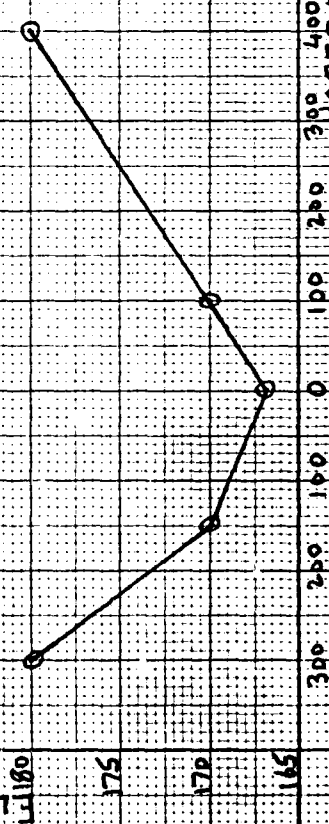
EB 6/6/81

SECTION CC

BALDWIN'S POND DAM
STAGE AREA CURVE
650 FT D/S OF SECTION BB

HORIZONTAL DISTANCE IN FEET
LOOKING DOWNSTREAM

ELEVATION IN FEET



AD-A143 355

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
BALDWIN'S POND DAM (CT.) (U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV JUL 81

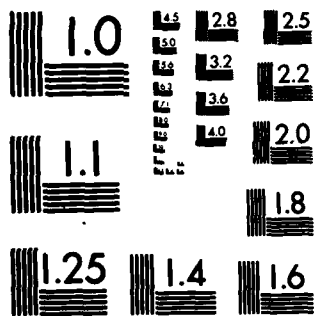
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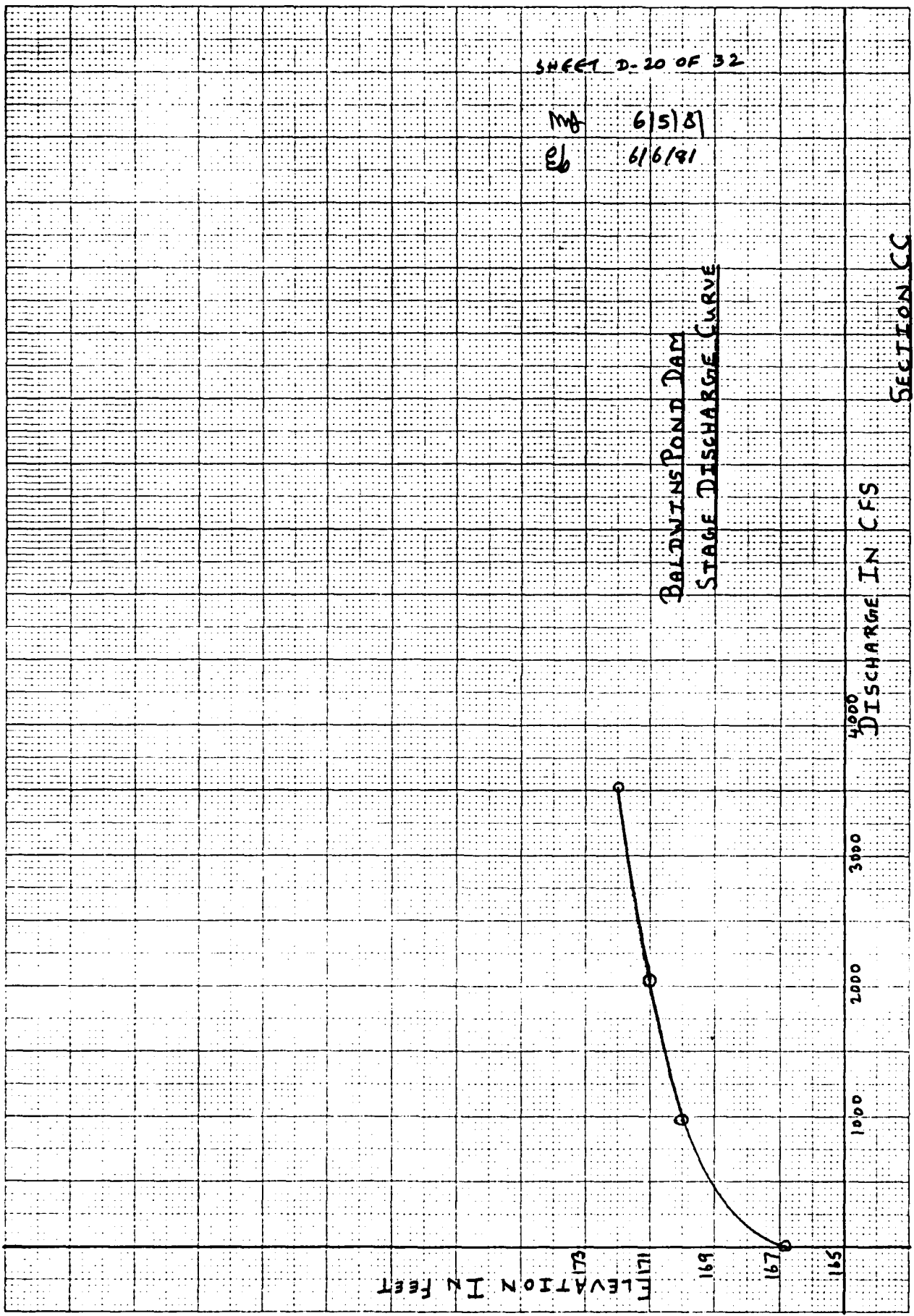
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

SHEET D-20 OF 32

MB 6/5/81

EB 6/6/91

BALDWINSPOND DAM
STAGE DISCHARGE CURVE
SECTION CC



PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-21 OF 32

NEW ENGLAND DIVISION

COMPUTED BY MA

DATE 6/5/81

BALDWIN'S POND DAM

CHECKED BY EB

DATE 6/6/81

SECTION DD

THIS SECTION IS SELECTED 1400' D/S OF SECTION CC
IMMEDIATELY BELOW NORTH BROAD STREET.
USING MANNING'S EQUATION

$$Q = \frac{1.486}{n} A R^{2/3} V$$

$$= 2.824 A R^{2/3}$$

$n = 0.06$ (cobble, windy) assumed
 $A = 0.013$ EST. FROM USGS MAP

EL	A	P	R	$R^{2/3}$	Q CFS
149.2	0	—	—	—	0
150	30	75	0.4	0.54	50
152	170	95	1.78	1.5	720
154	410	115	3.57	2.33	2,700

FROM STAGE AREA AND STAGE-DISCHARGE CURVES, FOR
SECTION DD

FOR $Q_{P1} = 2,300$ CFS, ELVN = 153.6 AND AREA = 3685 SQ. FT.

VOLUME OF REACH $V_1 = \frac{1400 \times 368}{43,560} \approx 12$ AC-FT.

TRIAL $Q_{P2} = Q_{P1} (1 - \frac{V_1}{5}) = 2,300 (1 - \frac{12}{40}) \approx 1,600$ CFS

FOR THIS Q_{P2} THE STAGE-DISCHARGE CURVE GIVES

ELVN = 152.95 AND AREA = 295 SQ. FT.

VOLUME OF REACH $V_2 = \frac{1400 \times 295}{43,560} \approx 9$ AC-FT.

TRIAL $Q_{P2} = Q_{P1} (1 - \frac{V_1}{5}) = 2,300 (1 - \frac{12+9}{40}) \approx 1,700$ CFS

FLOOD STAGE AT SECTION DD = 153 NGVD

FLOOD DEPTH AT SECTION DD = 153 - 149.2 = 3.8 FT

VELOCITY AT SECTION DD = $\frac{1,700}{300} \approx 5.6$ FPS

THE GROUND FLOOR OF THE NEAREST HOUSE ON NORTH BROAD STREET IS 5'± ABOVE THE STREAM BED. THEREFORE THE HOUSE IS NOT EXPECTED TO BE IMPACTED.

HOWEVER, BROOKSIDE PARK, WHICH BEGINS AT THIS SECTION WILL BE FLOODED WITH 2'± OF WATER.

SHEET D-22 OF 32

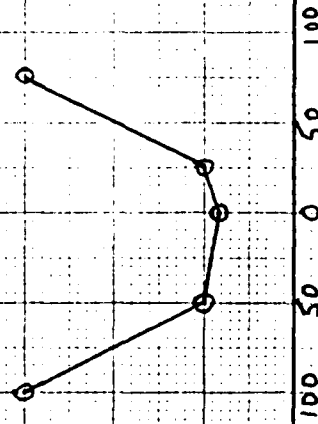
MA 6/5/81
EB 6/6/81

BALDWIN'S POND DAM
STAGE AREA CURVE
1400 FT D/S OF SECTION CC

SECTION DD

HORIZONTAL DISTANCE IN FEET
LOOKING DOWNSTREAM

ELEVATION IN FEET



SHEET D-20 OF 32

MB 6/5/81

EB 6/6/81

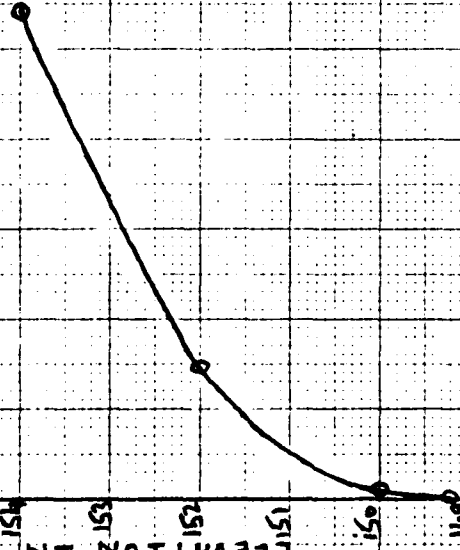
BALTIMORE POND DAM
STAGE DISCHARGE CURVE

SECTION DD

DISCHARGE IN CFS

0 500 1000 1500 2000 2500 3000

ELEVATION IN FEET
149 150 151 152 153 154



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PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-24 OF 32
NEW ENGLAND DIVISION COMPUTED BY MMB DATE 6/5/81
BALDWIN'S POND DAM CHECKED BY EB DATE 6/6/81

SECTION EE

THIS SECTION IS SELECTED 1150' D/S OF SECTION DD. AND IS LOCATED IN THE MIDDLE OF BROOKSIDE PARK.

USING MANNING'S EQUATION -

$$Q = \frac{1.486}{n} A R^{2/3} \Delta^{1/2} = 2.66 A R^{2/3}$$

$n = 0.05$ assumed.

$\Delta = 0.008$ Est. from USGS map

EL	A	P	R	$R^{2/3}$	Q CFS
140	0	-	-	-	0
142	45	45	1	1	120
144	180	90	2	1.6	765
145	280	112	2.5	1.84	1,370
146	405	135	3	2.08	2,240

FROM STAGE AREA AND STAGE-DISCHARGE CURVES,

FOR SECTION EE

FOR $Q_{P1} = 1,700$ CFS, ELVN = 145.4 AND AREA = 324 SQ. FT

$$\text{VOLUME OF REACH } V_1 = \frac{1150 \times 324}{43,560} \approx 8.5 \text{ AC-FT}$$

$$\text{TRIAL } Q_{P2} = Q_{P1} \left(1 - \frac{V_1}{S}\right) = 1,700 \left(1 - \frac{8.5}{40}\right) \approx 1,350 \text{ CFS}$$

FOR THIS Q_{P2} THE STAGE-DISCHARGE CURVE GIVES

ELVN = 144.95 AND AREA = 272 SQ. FT

$$\text{VOLUME OF REACH } V_2 = \frac{1150 \times 272}{43,560} \approx 7 \text{ AC-FT}$$

$$\text{TRIAL } Q_{P2} = Q_{P1} \left(1 - \frac{V_1}{S}\right) = 1,700 \left(1 - \frac{8.5+7}{40}\right) \approx 1350 \text{ CFS}$$

FLOOD STAGE AT SECTION EE = 144.95 NGVD

FLOOD DEPTH AT SECTION EE = 144.95 - 140 = 5 FT

$$\text{VELOCITY AT SECTION EE} = \frac{1350}{272} \approx 5 \text{ FPS}$$

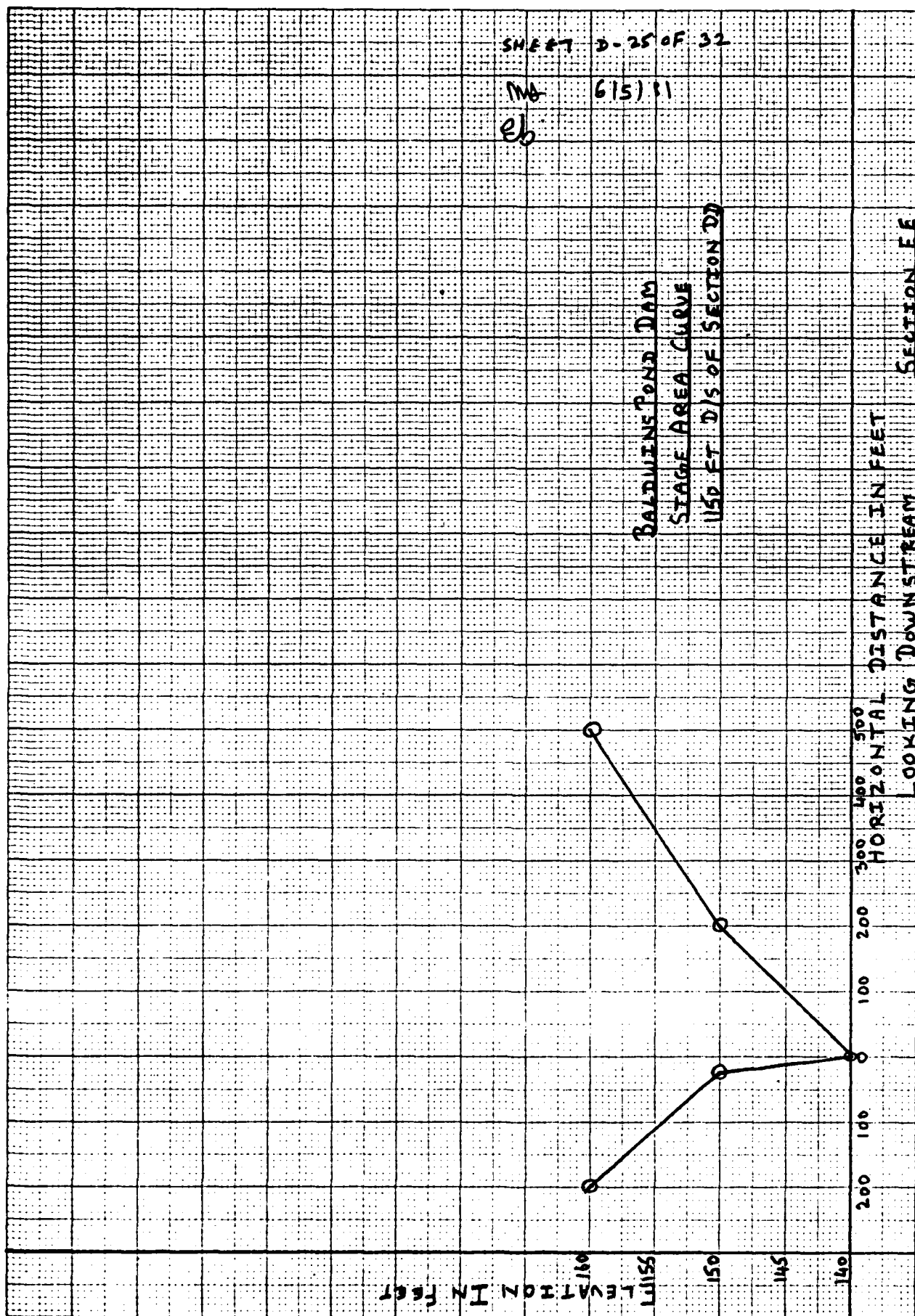
IT IS EXPECTED THAT THE BROOKSIDE PARK WILL BE INUNDATED WITH 2' OF FLOOD WATERS.

SHEET D-25 OF 32

MA 61511

eb

BALDWIN'S POND DAM
STAGE AREA CURVE
1150 FT. D/S OF SECTION DD



SECTION EE

LOOKING DOWNSTREAM

SHEET D-26 OF 32

MA 6/5/81

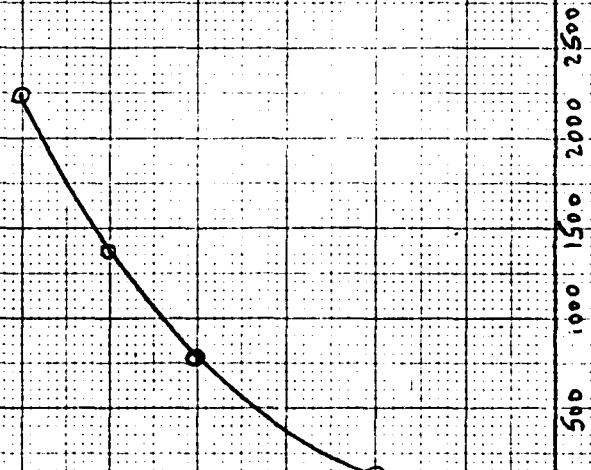
6/6/81

BALDWIN POND DAM
STAGE DISCHARGE CURVE

DISCHARGE IN CFS

SECTION EE

LEVEL IN FEET



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PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET D-27 OF 32

NEW ENGLAND DIVISION

COMPUTED BY MA

DATE 6/5/81

BALDWIN SPOND DAM

CHECKED BY EB

DATE 6/6/81

SECTION FF

THIS SECTION IS SELECTED 700' D/S OF SECTION EE AND JUST ABOVE RT 66.

USING MANNING'S EQUATION -

$$Q = \frac{1.486}{n} A R^{2/3} S^{1/2}$$

$$= \frac{1.486}{2.1} A R^{2/3}$$

$n = 0.05$ Assumed

$S = 0.005$ Est. from USGS map

ELVN	A SQ. FT. SECTIONS EE FF		P. SECTIONS EE FF		A AVE	P AVE	R	$R^{2/3}$	Q CFS
136.5	0	0	-	-	-	-	-	-	-
140	0	262	-	150	131	75	1.75	1.45	400
142	45	812	45	400	428	222	1.93	1.55	1395

FROM STAGE AREA AND STAGE-DISCHARGE CURVES (SECTION EE AND FF COMBINED CURVES)

FOR $Q_1 = 1,350$ CFS, ELVN = 141.9 AND AREA = 410 SQ. FT.

$$\text{VOLUME OF REACH } V_1 = \frac{700 \times 410}{43.560} \approx 6.5 \text{ AC-FT.}$$

$$\text{TRIAL } Q_2 = Q_1 \left(1 - \frac{V_1}{S}\right) = 1,350 \left(1 - \frac{6.5}{40}\right) \approx 1,150 \text{ CFS}$$

FOR THIS Q_2 THE STORAGE-DISCHARGE CURVE GIVES ELVN = 141.6 AND AREA = 350 SQ. FT.

$$\text{VOLUME OF REACH } V_2 = \frac{700 \times 350}{43.560} \approx 5.5 \text{ AC-FT.}$$

$$\text{RECOMPUTING } Q_2 = 1,350 \left(1 - \frac{6.5 + 5.5}{40}\right) \approx 1,150 \text{ CFS}$$

FLOOD STAGE AT SECTION FF = 141.6 NGVD

FLOOD DEPTH AT SECTION FF = 141.6 - 136.5 = 5 FT

$$\text{VELOCITY AT SECTION FF} = \frac{1,150}{350} \approx 3 \text{ FPS}$$

THE RT 66 BOX CULVERTS ARE ESTIMATED TO HAVE A CAPACITY OF 1470 CFS. THUS ADEQUATE TO PASS THE 1150 CFS PEAK OUTFLOW AT THIS SECTION. FURTHER D/S THE CULVERT ON CAMP AVE. AND THE CHANNEL BELOW ARE EST. TO HAVE ADEQUATE CAPACITY TO CONVEY THIS PEAK OUTFLOW.

SHEET D-28 OF 32

NO 615121

EB 6/1/81

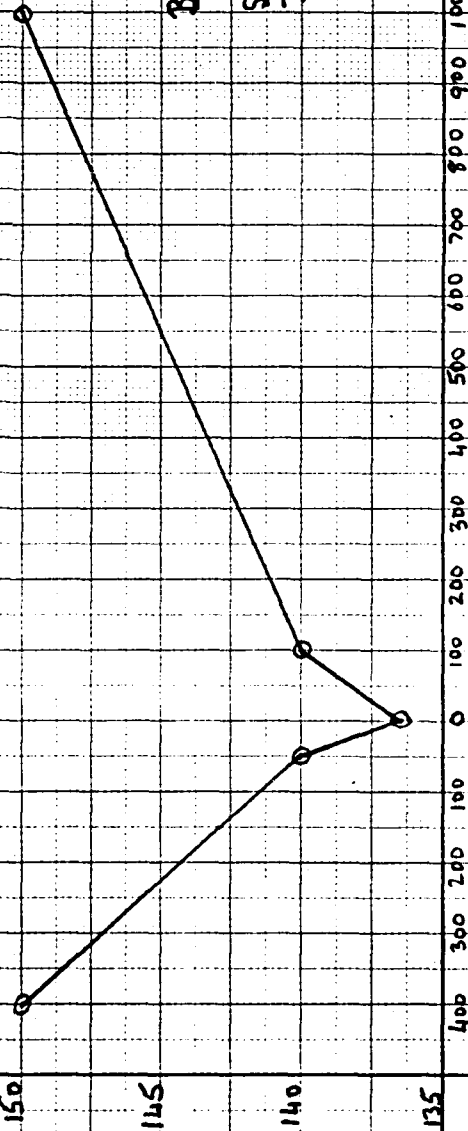
BALDWIN'S POND DAM

STAGE AREA CURVE
700 FT DIS OF SECTION EF

SECTION EF

HORIZONTAL DISTANCE IN FEET
LOOKING DOWNSTREAM

ELEVATION IN FEET



SHEET D-29 OF 32

MB 6/5/81

86 6/6/81

ELEVATION IN FEET

142

141

140

139

138

137

136

135

0

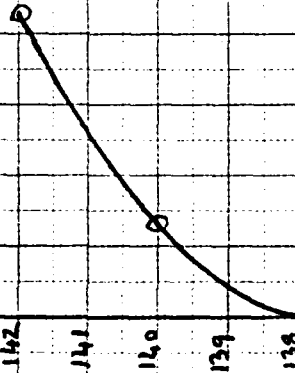
100 200 300 400 500

AVERAGE AREA CURVE

BALDWIN'S POND DAM

STAGE AREA CURVE

SECTION EE AND SECTION FF

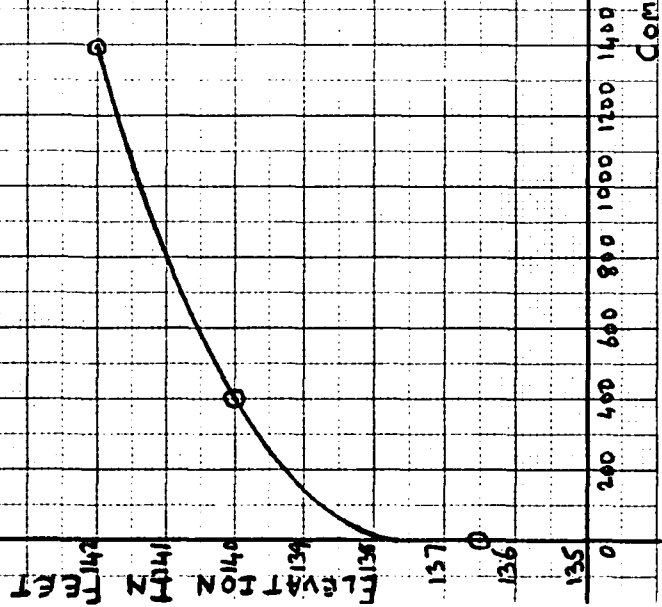


SHEET D-30 OF 32

NO. 615181

ED 6/6181

BALDWIN POND DAM
STAGE-DISCHARGE CURVE



SECTIONS EE AND FF

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PROJECT NON FEDERAL DAM INSPECTION PROJECT NO 81-21-11 SHEET D-31 OF 32
NEW ENGLAND DIVISION COMPUTED BY MW DATE 6/5/81
BALDWINS POND DAM CHECKED BY EB DATE 6/6/81

FAILURE HAZARD POTENTIAL

BASED UPON THE EXISTING INFORMATION, THE LOWEST SECTION OF THE DAM APPEARS TO BE IN THE VICINITY OF THE MAIN SPILLWAY AND IT IS PRESUMED THAT BREACH OF THE DAM WOULD OCCUR IN THIS VICINITY. THE FAILURE ANALYSIS WAS PERFORMED WITH POOL AT TOP OF DAM (EL. 196.8 NGVD).

SUMMARY OF BREACH ANALYSIS RESULTS:

LOCATION	DISTANCE FR. DAM, FT.	PEAK FLOW RATE, CFS	FLOOD STAGE NGVD	FLOOD DEPTH, FT	VELOCITY FPS.
DAM	0	5000	188.1	6.8	—
AA	100	4850	183.8	5.2	8.3
BB	1150	3400	176.6	6.6	5.0
CC	1800	2300	171.5	4.7	3.0
DD	3200	1700	153.0	3.8	5.6
EE	4350	1350	145.0	5.0	5.0
FF	5050	1150	141.6	5.0	3.0

THE BRIDGE ON WESTFIELD RD IMMEDIATELY BELOW THE DAM IS EXPECTED TO BE SEVERELY IMPACTED UNDER DAM FAILURE CONDITION SINCE THE CAPACITY OF THE BRIDGE IS ESTIMATED TO BE ONLY 1120 CFS WHEREAS THE PEAK FLOW IS EST. TO BE 4850 CFS WITH A HIGH VELOCITY OF 8.3 FPS. SIMILARLY, THE CULVERT FURTHER D/S ON WESTFIELD RD DOES NOT HAVE THE CAPACITY TO PASS THE PEAK FLOOD FLOW OF 3400 CFS (SECTION BB) AND POTENTIAL FOR FLOOD IMPACT ON THE CULVERT EXISTS. FURTHER D/S BROOKSIDE PARK, LOCATED BETWEEN NORTH BROAD STREET (SECTION DD) AND ROUTE 66 (SECTION FF) IS EXPECTED TO BE INUNDATED WITH 2' FLOOD WATERS. THE PARK APPEARS TO BE IN ACTIVE USE BY PEOPLE OF ALL AGES AND THE DAM FAILURE COULD RESULT IN LOSS OF A FEW LIVES. HENCE, A HAZARD POTENTIAL OF SIGNIFICANT MAGNITUDE IS CONSIDERED LIKELY.

DIVERSIFIED TECHNOLOGIES CORP.

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PROJECT NON FEDERAL DAM INSPECTION PROJECT NO. 81-21-11 SHEET 2-32 OF 32
NEW ENGLAND DIVISION COMPUTED BY MA DATE 6/8/81
BALDWINS POND DAM CHECKED BY EB DATE 6/9/81

SUMMARY - HYDRAULIC/HYDROLOGIC COMPUTATIONS

PERFORMANCE AT PEAK FLOOD CONDITIONS:

TEST FLOOD	100 YR
PEAK INFLOW	4100 CFS
PEAK OUTFLOW	4035 CFS
MAIN SPILL.CAP. TO TOP OF DAM (EL.196.8NGVD)	450 CFS
MAIN SPILL.CAP. TO TOP OF DAM % OF PEAK OUTFLOW	11
MAIN SPILL. CAP.TO PEAK FLOOD ELVN (199.2NGVD)	1600 CFS
MAIN SPILL. CAP.TO PEAK FLOOD ELVN % OF PEAK OUTFLOW	40

SECONDARY SP.CAP TO PEAK FLOOD ELVN	325 CFS
SECONDARY SP. CAP TO PEAK FLOOD EL % OF PEAK OUTFLOW	8

PERFORMANCE:

MAXIMUM POOL ELVN	199.2 NGVD
MAX. SURCHARGE HEIGHT ABOVE MAIN SPILL.CR	4.2 FT
NON-OVERFLOW SECTION OF THE DAM OVERTOPPED BY	2.4 FT

DOWNSTREAM FAILURE CONDITIONS:

PEAK FAILURE OUTFLOW	5000 CFS
FLOOD DEPTH IMMEDIATELY D/S FROM DAM	6.8 FT
CONDITIONS AT IMPACT AREA-BROOKSIDE PARK(SECTION EE):	
ESTIMATED STAGE BEFORE FAILURE	143.5
ESTIMATED STAGE AFTER FAILURE WITH 1350 CFS	145
ESTIMATED RAISE IN STAGE AFTER FAILURE ΔY	1.5 FT

APPENDIX E

**INFORMATION AS CONTAINED IN
THE NATIONAL INVENTORY OF DAMS**

NOT AVAILABLE AT THIS TIME

END

FILMED

9-84

DTIC